university of alberta

long range landscape development plan

university of alberta

long range landscape development plan stage two: master plan

Hough, Stansbury + Associates Limited

Land Resource Planning
Environmental Research
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July 1971

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51 Colborne St., Toronto 1, Ontario (416)-366-9497
10920-88 Ave., Edmonton, Alberta (403)-439-0665

October 14, 1971

Dr. W. D. Neal,
Vice President,
Planning & Development,
The University of Alberta,
Edmonton, Alberta.

Dear Dr. Neal:

We are pleased to submit our second stage report concerning the Long Range Landscape Planning for the University of Alberta, in accordance with the terms of reference set out in Mr. Walter Hiller's letter of March 31, 1971.

We would again like to express our appreciation to you, the Campus Development Office and Faculty and Students of the University with whom we have had contact for the cooperation and assistance they have given to the preparation of this report. The continuing involvement of the University Community will, we believe be essential to the ultimate success of the plan.

The report on lighting and street furniture is currently being prepared as an extension of the Master Landscape Plan and will be submitted to you later on in the fall.

Yours sincerely,

Michael Hough

MH/sw
Encl.

Michael Hough,
DIP. ARCH. (Edin.)., M.L.A. (Penn.)., A.R.I.B.A., C.S.L.A., A.S.L.A.

James Stansbury,
B.L.A. (Syracuse)., C.S.L.A., O.A.L.A.

Frederick Daubert, N.P.D.
Principal, Landscape Coordinator

Robert Groot, O.A.C.E.T.T., N.V.W., N.B.V.
Associate, Engineering Coordinator

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INTRODUCTION

This report is the second stage of the overall Long Range Landscape Development Plan, whose objective is to set down the comprehensive principles, guidelines and recommendations for landscape development for the University of Alberta. It follows the Stage 1 Analysis report of February 1971, which was concerned with fact finding and analysis of factors relating to the outdoor campus, and the establishment of a user program, and should be read in conjunction with this report.

Its purpose is to establish a framework for orderly site development and rational guidelines for future implementation that include servicing and surface parking, pedestrian movement, open space, climate, and planting. These guidelines will allow changes to occur in physical development without undermining the principles established in the overall plan, since they may be interpreted in a variety of ways at a detailed level.

The report also makes recommendations with regard to future phasing, implementation. It concentrates primarily on those parts of the campus where the building program is known, and the development principles that should be established for this program.

In other areas, specifically the West Campus, and North Garneau property, recommendations are geared to the integration of building and site in future planning.

The study area includes the campus between Saskatchewan Drive and 87th Avenue, the West Campus, and North Garneau area. The terms of reference do not include maintenance and long term landscape management, or lighting and street furniture proposals. This latter study will be the subject of a further report to be completed in the fall. The former should be considered at a future time in conjunction with a detailed implementation program.

The sources of information drawn on in the preparation of the report include the Diamond & Myers Long Range Development Plan, reports by other consultants, the Campus Development Office, and members of the University Community. In addition, further study of the campus was carried out between the beginning of April and the first week of May, 1971.

summary of landscape principles

SUMMARY OF LANDSCAPE PRINCIPLES

The following summary highlights the most important landscape principles outlined in detail in the report.

The illustrations are included to emphasize the concept and spirit behind these principles rather than actual proposals for the University of Alberta Campus.

PEDESTRIAN CIRCULATION

A primary system of three routes forms the major spines of the campus, making connections to the interior pedestrian system and the centres of outdoor activity. The following principles are relevant to this system:

The principle of the park like walk enhancing an already existing environment. (North South route through the Central Quad)

The principle of the urban tree lined promenade, linking high activity spaces. (North South route up 112th street)

The principle of the exterior urban street linking arrival areas, drop off and bus stops, and major gathering spaces. East, West route along 89th avenue (see above and right.)

The principle of the major gathering area or node where links between indoor and outdoor movement occur, where information, and directions to various destinations may be had, and where activity, meeting and socializing occur. (see left)

places to gather, obtain information

places for year round recreation and activity

OPEN SPACE

Open space should include the principle of maximum diversity - of uses and environments such as :

places to eat

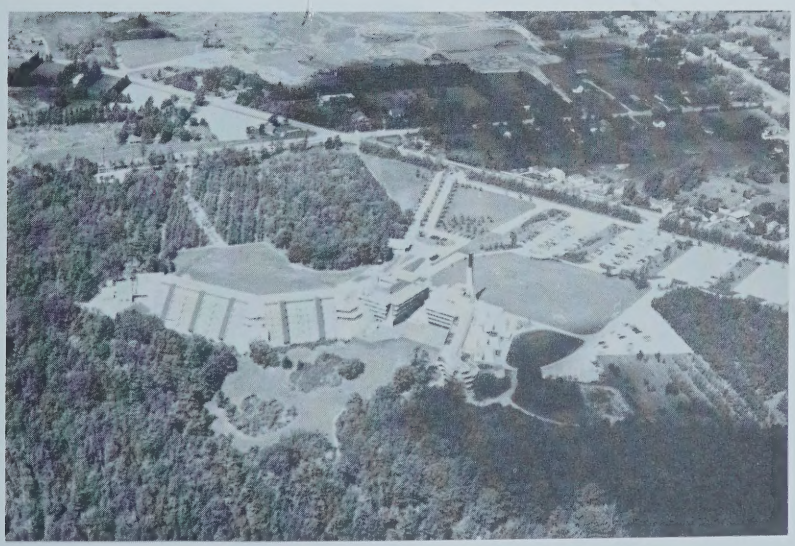
places to sit or study.

Some spaces will accommodate recreational and passive activities with identifyable movement patterns through them; their quality will be determined by soft landscape elements that include walks, expanses of turf, trees and shrubs. (see directly below)

Other spaces are small, urban and formed by buildings where colour, murals, sculpture, paving and walls determine their character. (see below)

Open space should include the principle of linkage with the community :

At street corners, and along street setbacks where the University and city interact.



By making connections with the parkland and recreation resources of the city on the river bank.

The principle of creating open space at a +15 level and on upper level roof tops is of major importance where high density development will preclude significant open space at grade, and where large expanses of roof are seen from tall buildings.

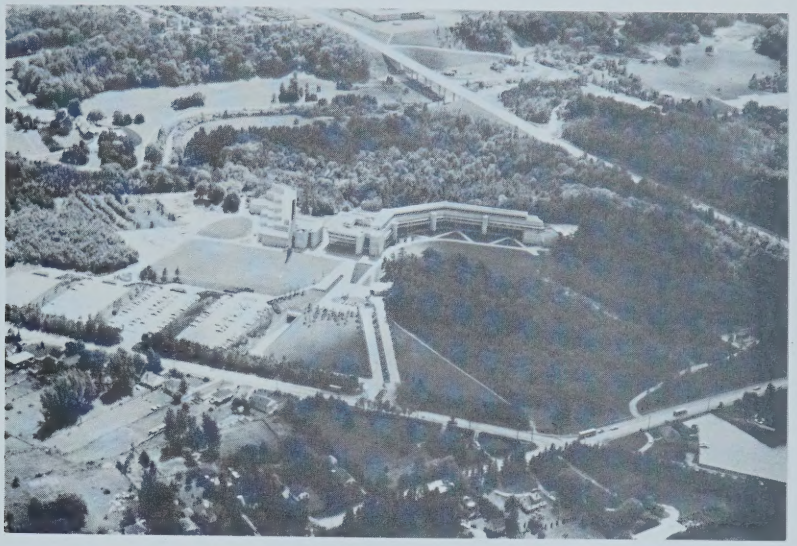
There should be strong physical and visual connections between open spaces at grade and at upper levels. (see left)

Major roof top spaces are important for hard court games.

Minor roof top spaces provide useful passive recreation and visual area where planting, turf, sitting areas, and colour can occur.

PLANTING

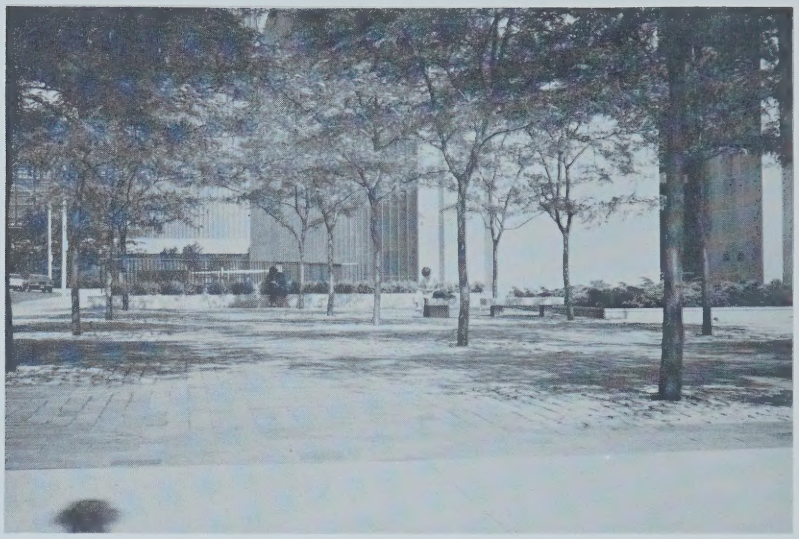
Plants should emphasize the principle of green corridors linking the river valley, the inner campus, and the connections to the community on the periphery of the campus. (see below)



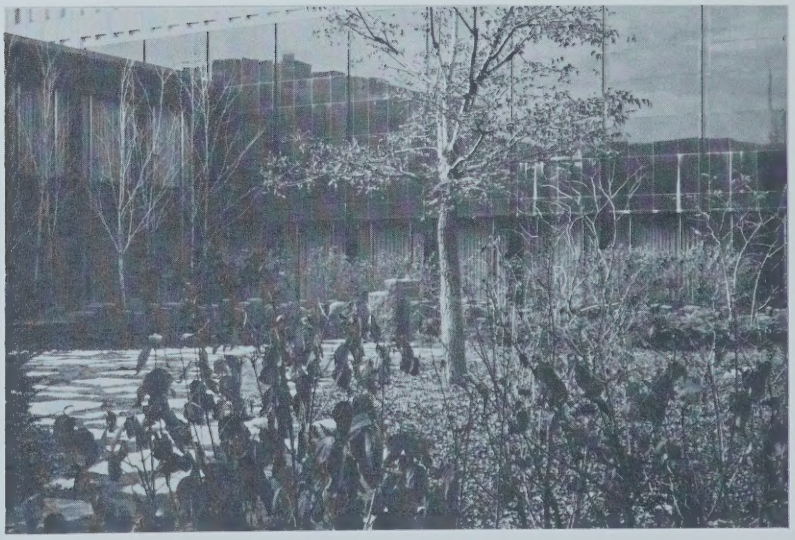
Plants, in particular evergreens, are critical in winter to provide protection and shelter from winter winds. (see lower left and right)

Plants contribute to the character and function of spaces in many ways including :

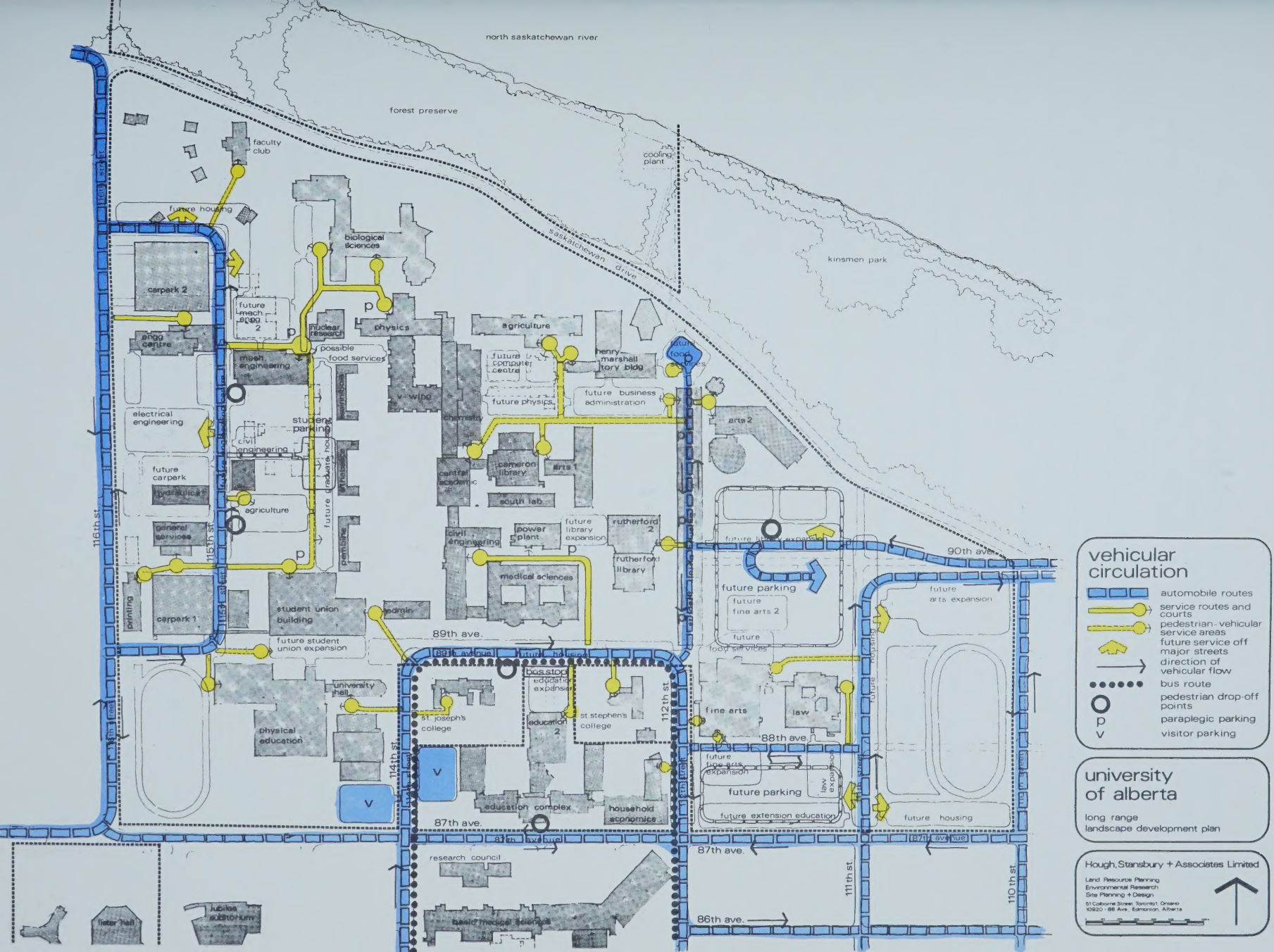
Providing shade and canopy in summer and allowing sun to penetrate in winter.



Creating interest at all times of year, and contrast to architecturally dominant spaces.



vehicular circulation


north saskatchewan river
forest preserve
saskatchewan drive
kinsmen park
faculty club
cooling plant
future housing
biological sciences
carpark 2
future mech engg 2
engg centre
nuclear research
physics
agriculture
possible food services
mech engineering
future computer centre
henry marshall tory bldg
future food services
v-wing
future physics
future business administration
electrical engineering
student parking
civil engineering
chemistry
arts 2
future carpark
hydraulics
cameron library
arts 1
central academic
south lab
agriculture
general services
power plant
future library expansion
rutherford 2
civil engineering
rutherford library
medical sciences
printing
carpark 1
student union building
admin
future student union expansion
university hall
physical education
st joseph's college
education 2
education expansion
bus stop
st stephen's college
education complex
household economics
research council
basic medical sciences
jubilee auditorium
tory trail
future parking
future fine arts 2
future food services
future arts expansion
fine arts
law
future fine arts expansion
law expansion
future extension education
future housing
116th st
115th st
114th st
112th st
111th st
110th st
89th ave.
88th ave.
87th ave.
86th ave.
90th ave.
vehicular circulation
automobile routes
service routes and courts
pedestrian-vehicular service areas
future service off major streets
direction of vehicular flow
bus route
pedestrian drop-off points
p paraplegic parking
v visitor parking
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VEHICULAR CIRCULATION

Current policy decisions with regard to the University road network are taken as a base for landscape planning, together with certain assumptions where policy may be subject to change.

1. 87th Avenue to remain open to through traffic.

2. 89th Avenue to be closed as a through route, and become a major vehicular entrance to the campus. The bus and vehicular drop-off route, to be one-way north on 114th Street, joining 89th Street, and south on 112th Street.

3. A second vehicular entrance to the campus westbound along 90th Avenue to future parking and drop-off, and looping back onto 90th Avenue. Access to 112th Street under student housing to be local traffic to parking and service points.

4. A northbound one-way route along 111th Street and joining 90th Avenue.

5. A third vehicular entrance to the campus to be a two-way route from 116th Street, with one-way access at 89th Avenue, north along 115th and connecting,just north of car park II, to 116th street.

6. Saskatchewan Drive should be ultimately closed within the limits of the campus on the basis that traffic under 112th Street housing will only serve local parking and service points.

7. Future parking for housing on the West Campus should have access from the main arrival loop on the cul-de-sac system proposed for service traffic.

8. Other existing streets within the campus to be closed, as shown on the vehicular and service access plan.

Service Traffic

Four basic methods for organizing service routes and loading points are proposed within the known building program; and for the West Campus and North Garneau Area.

1. A cul-de-sac road system off main vehicular routes, servicing loading and turn-around points. (diagram 1)

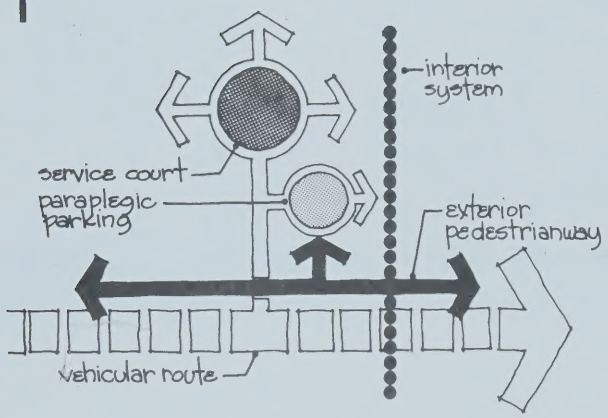
2. Service courts servicing groups of buildings. (diagram 1)

3. Where service roads and pedestrian routes must coincide, they are proposed as pedestrian ways, with allowance for service traffic. (diagam 2)

4. Servicing directly off the street.

5. Grade separated servicing in North Garneau future development. At present all service vehicles coming into the campus have access to all buildings, thereby causing unnecessary congestion. Consideration' should be given to a review of the present system in terms of reducing the number of vehicles allowed on campus. This might be achieved by a central receiving depot and using lighter vehicles servicing individual buildings during off-peak periods.

1



Surface Parking

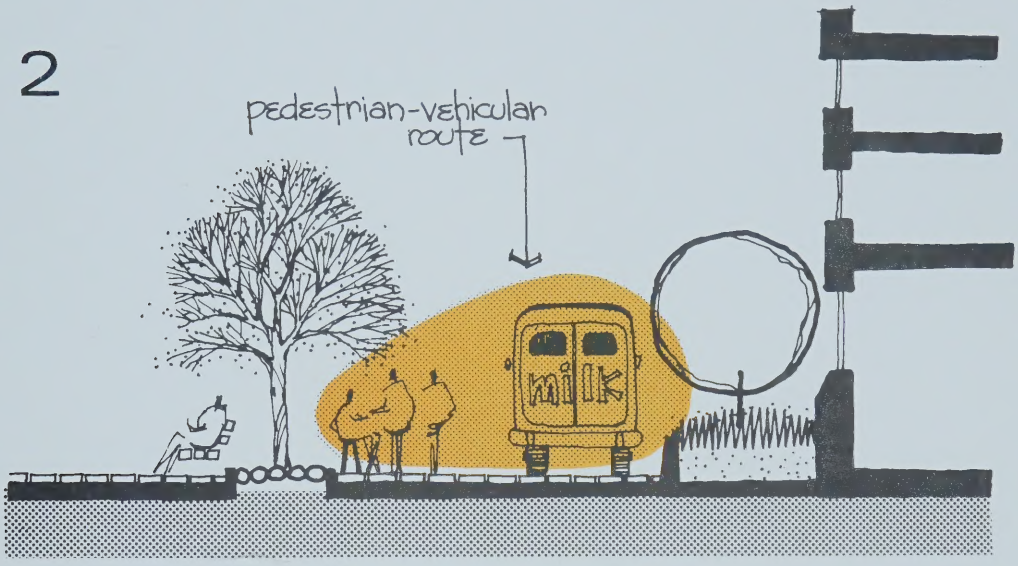
A detailed evaluation of surface parking requirements is not included in this report. Instead, the master landscape plan proposes the following guidelines for future development.

1. Provision of surface parking for service or private vehicles for delivery or pick-up to be incorporated into service court areas. (Diagram 1)

2. Provision of parking for the handicapped to be located adjacent to buildings and incorporated into service courts or access roads. (Diagram 1)

3. In future development service outlets and garbage storage should be incorporated into new buildings, to be out of sight, particularly in situations where there is important pedestrian movement. Similarly, service traffic should not impinge on important pedestrian spaces or movement, except where it is unavoidable.

2



emergency vehicles

north saskatchewan river
forest preserve
cooling plant
saskatchewan drive
kinsmen park
faculty club
future housing
biological sciences
carpark 2
future mech. engg 2
engg centre
nuclear research
physics
agriculture
possible food services
mech. engineering
future computer centre
henry marshall tory bldg
future food services
v-wing
future physics
future business administration
electrical engineering
chemistry
arts 2
civil engineering
future carpark
hydraulics
future graduate housing
athabasca
cameron library
arts 1
central academic
agriculture
south lab
general services
power plant
future library expansion
rutherford 2
pembina
civil engineering
rutherford library
student union building
medical sciences
printing
carpark 1
admin
future student union expansion
future fine arts 2
future
89th avenue
future housing
university hall
future education expansion
st joseph's college
education 2
st stephens coll
physical education
fine arts
law
future fine arts expansion
law expansion
education complex
household economics
future extension education
future housing
research council
jubilee auditorium
lister hall
emergency vehicles
automobile routes
service routes
pedestrian routes
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EMERGENCY VEHICLES

Emergency routes proposed in the plan are drawn from information prepared by Stanley Associates Engineering Limited showing proposed fire hydrant locations. The following guidelines are relevant to this subject.

a) Routes should be located to relate as closely as possible to hydrants.

b) Routes follow, roads, service roads and pedestrian walks.

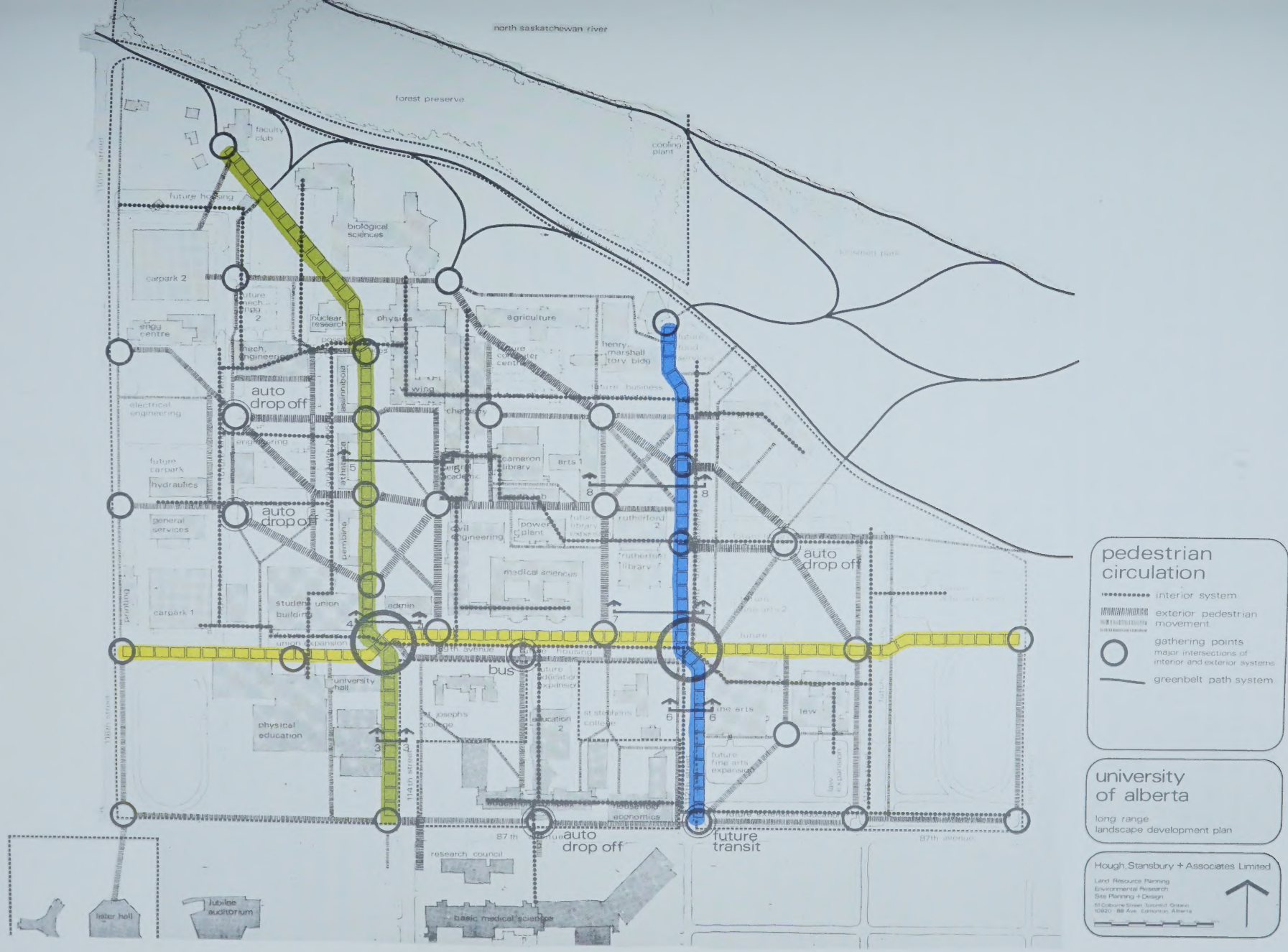
c) Routes should be looped rather than dead ended.

d) Clearance for routes passing under future building links should be 14' minimum.

e) Width of routes should be 10' minimum.

f) Walks used for emergency vehicles should be ramped where changes of level occur.

pedestrian circulation


north saskatchewan river
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cameron library
arts 1
future carpark
hydraulics
auto drop off
general services
civil engineering
power plant
rutherford 2
rutherford library
auto drop off
medical sciences
carpark 1
students union building
admin
bus
university hall
physical education
st joseph's college
education 2
st stephen's college
fine arts
law
future fine arts expansion
economics
87th avenue
auto drop off
future transit
research council
basic medical sciences
lister hall
jubilee auditorium
pedestrian circulation
interior system
exterior pedestrian movement
gathering points
major intersections of interior and exterior systems
greenbelt path system
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PEDESTRIAN CIRCULATION

Pedestrian circulation provides the basic framework that links movement, activities and places together into a comprehensive and identifyable system. The circulation concept for the campus is therefore fundamental to the development of a rational plan. It proposes a system of major and minor pedestrian linkages each having their own identity, function, and consequent character. It should be noted that the analysis report revealed strong diagonal desire lines, that in reality cannot be accommodated within the known building program except across major open spaces. It is a recommendation of this report that in new development in North Garneau the potential diagonal routes that will be generated should be accommodated, and integrated with future building.

The following pedestrian linkages are proposed for the known building program:

1. A primary system of three routes form the major spines of the campus making connections to the interior pedestrian system and the centres of outdoor activity. Four major gathering places, or nodes link the interior with the exterior system. Each route has its own particular character that will serve to create a strong sense of identity within the campus.

    a) A north-south greenway following the existing walk west of central quad, and making direct connection with the wooded slopes of the river valley. The park-like environment of existing sections, should be extended throughout the route. (Diagram 3, 4, 5)

    b) A north-south greenway following 112th Street and making direct connection with the river valley: its character will be derived from the more urban environments through which it passes. (Diagram 6, 7, 8)

    c) An east-west pedestrian route developed as a structured urban connection along 89th Avenue.

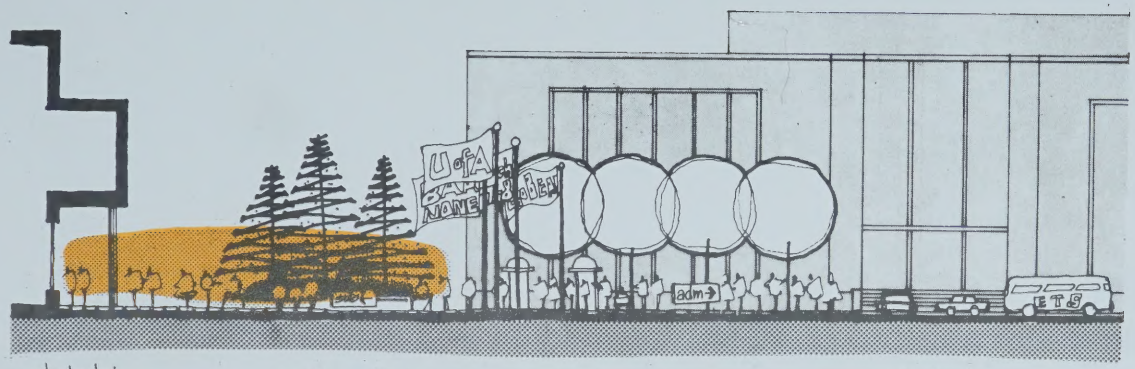
2. A secondary system of major routes that make connections to all other important destination points through the campus to accommodate predominant east-west, and diagonal movement patterns. These will tend to adopt the character of the places through which they pass, whether these be structured and urban, or informal and passive.

3. A minor system of routes that criss-cross through the campus and provide essential short-cuts and alternatives from one place to another.

3 WALK AT PHYSICAL EDUCATION

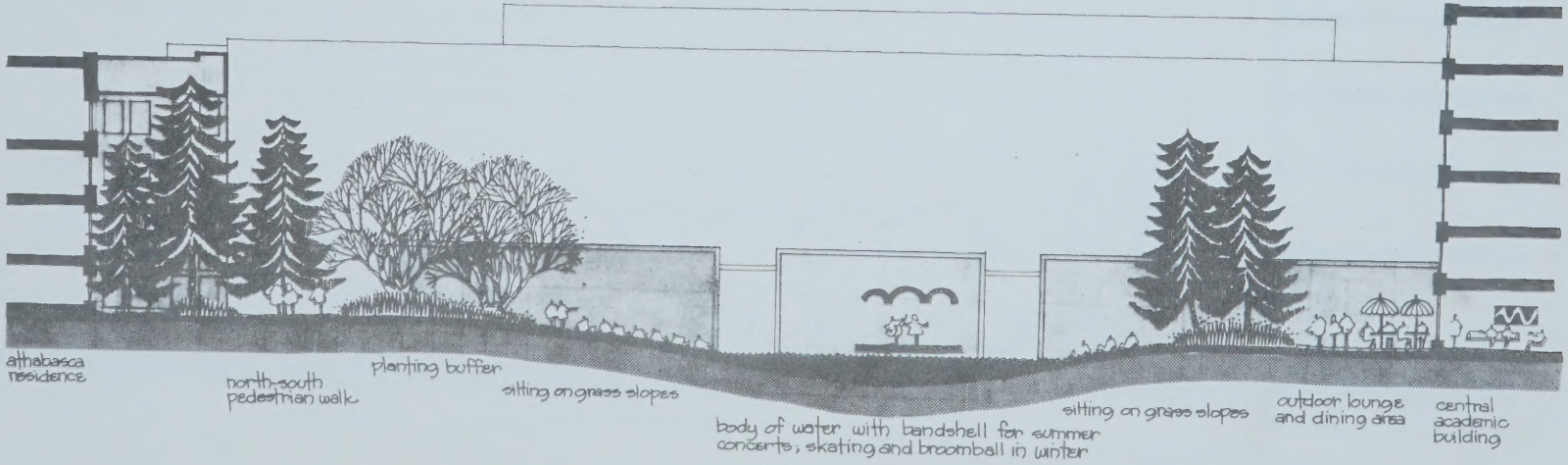
phys. ed. building | north-south pedestrianway | 114th street | dense planting

4 WALK AT S.U.B.



students' union | north-south pedestrianway | arrival area - maps, signage, information | 114th street

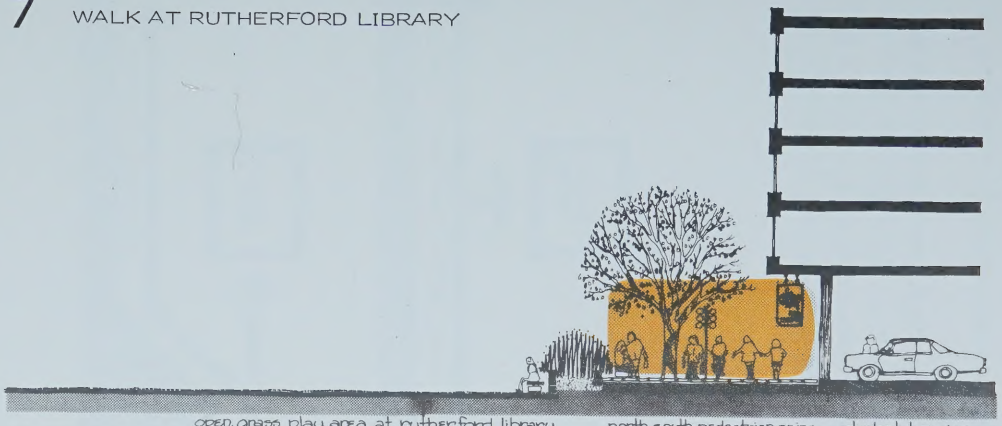
WALK AT ATHABASCA - CENTRAL QUAD 5



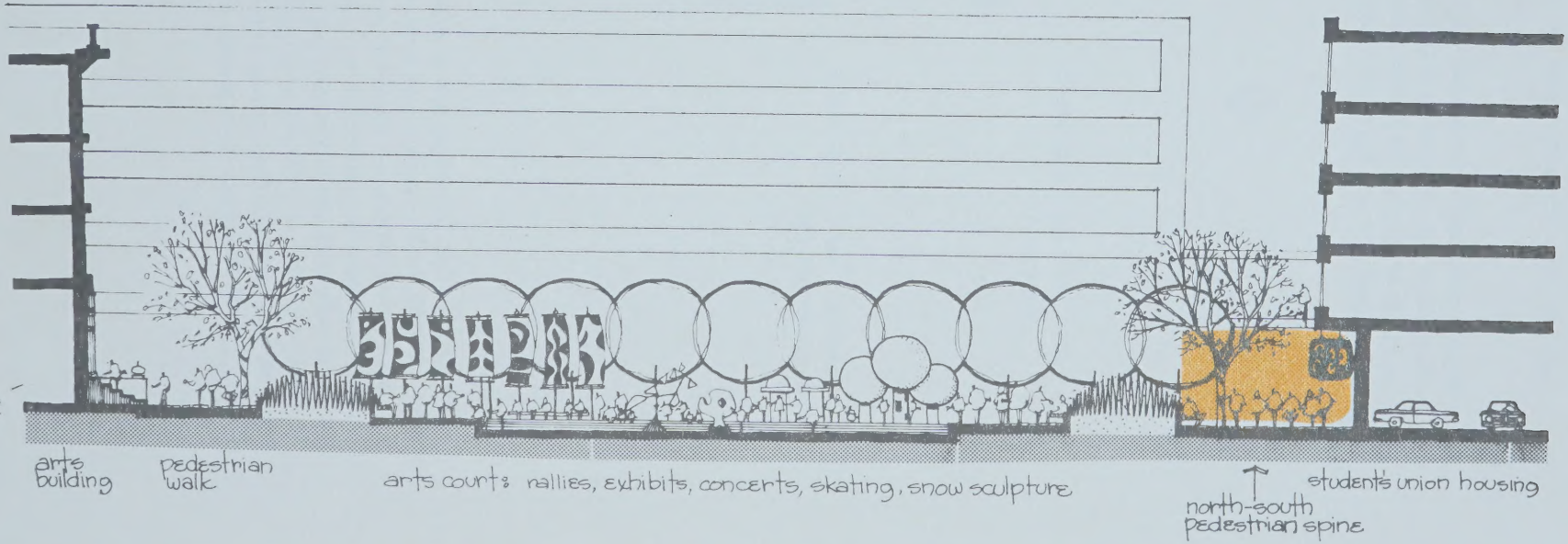
athabasca residence | north-south pedestrian walk | planting buffer | sitting on grass slopes | body of water with bandshell for summer concerts, skating and broomball in winter | sitting on grass slopes | outdoor lounge and dining area | central academic building

6 WALK AT FINE ARTS

7 WALK AT RUTHERFORD LIBRARY



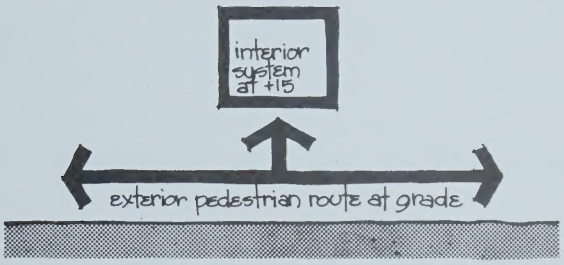
8 WALK AT ARTS COURT



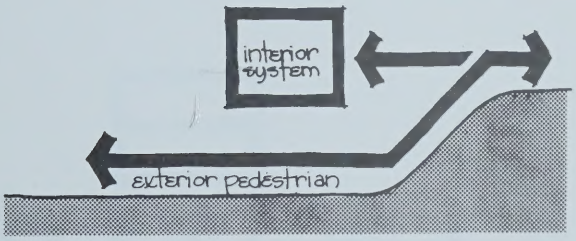
The following principles form the basis or recommendations for the design of pedestrian movement patterns.

1. All major walks should provide pedestrians or cyclists the option of moving through the campus without going inside. An exception to this principle is the west-east route connecting engineering to Henry Marshall Tory, which must pass through the V Wing. (Diagram 9)

9

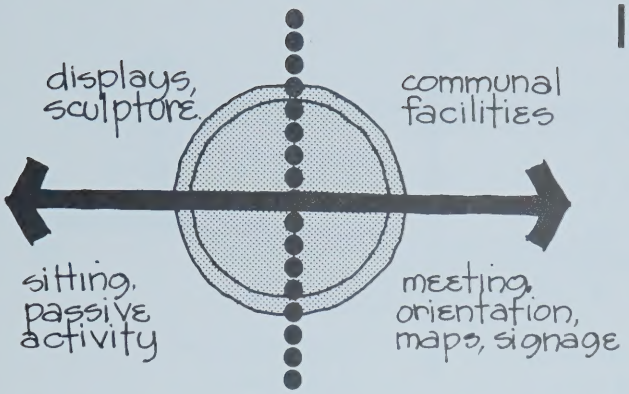


Example : Student Union Housing.



Example : West Campus development and C.A.B.

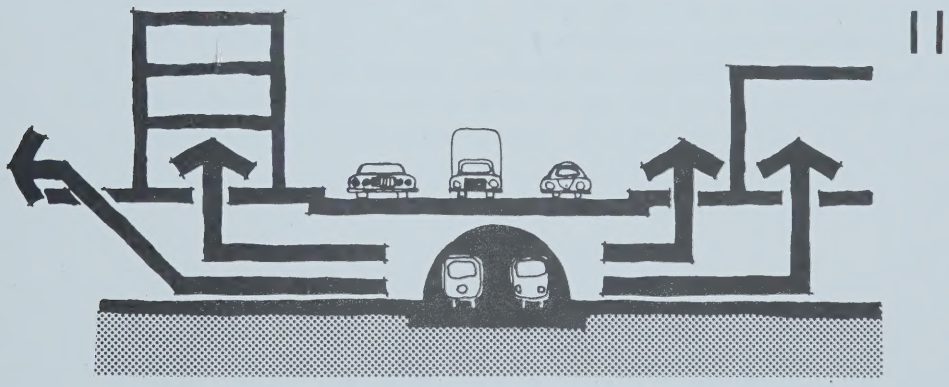
2. Gathering places are the places where the greatest activity is likely to occur. They are orientation points for visitors and others, where information and directions to other parts of the campus may be found, where displays, exhibitions, or informal concerts may be held, where bicycle stands should be incorporated and where many communal activities are held. They are located at intersections of routes, at transportation stops and bus drop-off points, and at important connections to the interior pedestrian streets. (Diagram 10)



10

3. Pedestrian vehicular conflict points may be resolved in three ways:

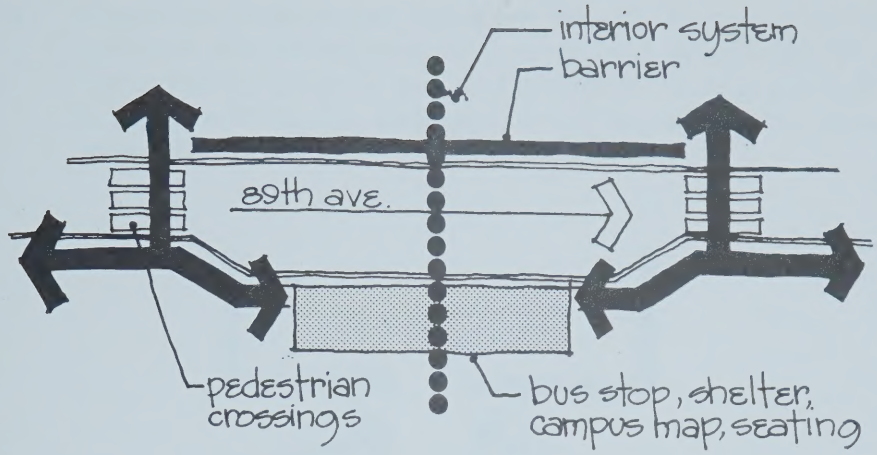
a) Pedestrian movement under major streets. This should be a basic principle in the planning of the future transit stop on campus. (Diagram 11)



11

b) Pedestrian movement channelled to specific points, and crossing major streets at grade. This method is related to reorganized crossing points on 87th Street, at 116th Street, (Lister Hall complex) at 112th Street (for pedestrians coming from South Garneau area), 87th at Education on temporary basis, and at the 89th Street bus drop-off where channelization is critical to avoid conflict with buses. (Diagram 12)

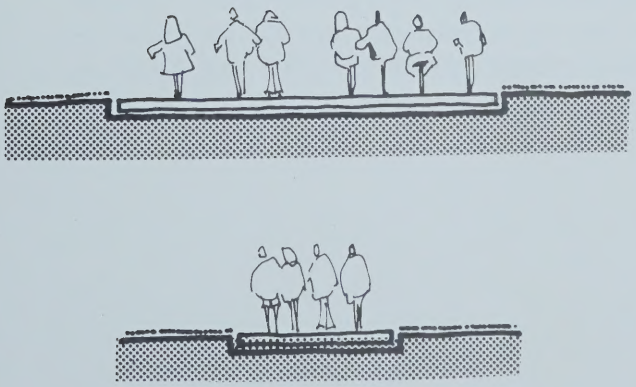
12

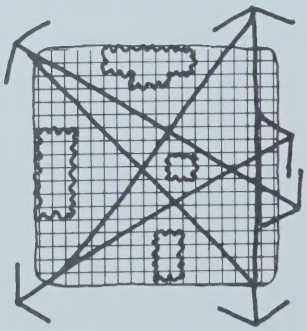


c) Pedestrian movement over major streets, specifically a connection between Medical Sciences and Education over 87th Avenue, as recommended in the Diamond & Myers Plan.

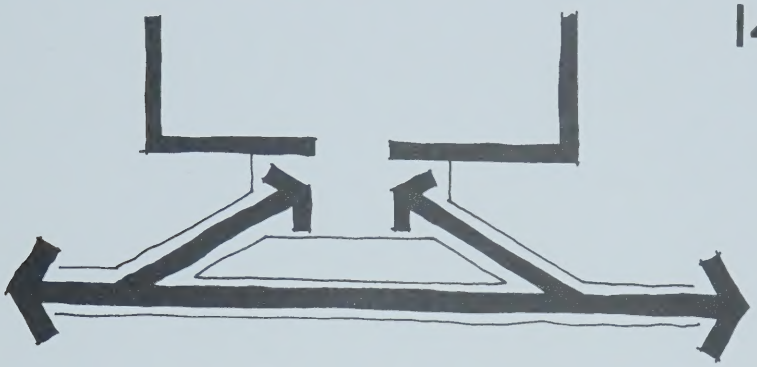
4. Walks having to accommodate major movement between buildings at peak periods between classes should be wide enough to take 6 to 8 people abreast. Minor walks should be able to take 3 to 4 people abreast. Spaces that must accommodate major movement across them from many directions should be considered as paved spaces that include planting rather than a series of crisscrossing walks. e.g. south end of Central Quad, and the Arts Court. (Diagram 13)

13





5. Pedestrian movement takes the line of least resistance. Path systems should respond to desire lines where possible, thus simplifying maintenance of turf and planting. Small gathering places at building entrances, protected from the elements, should be provided. (Diagram 14)

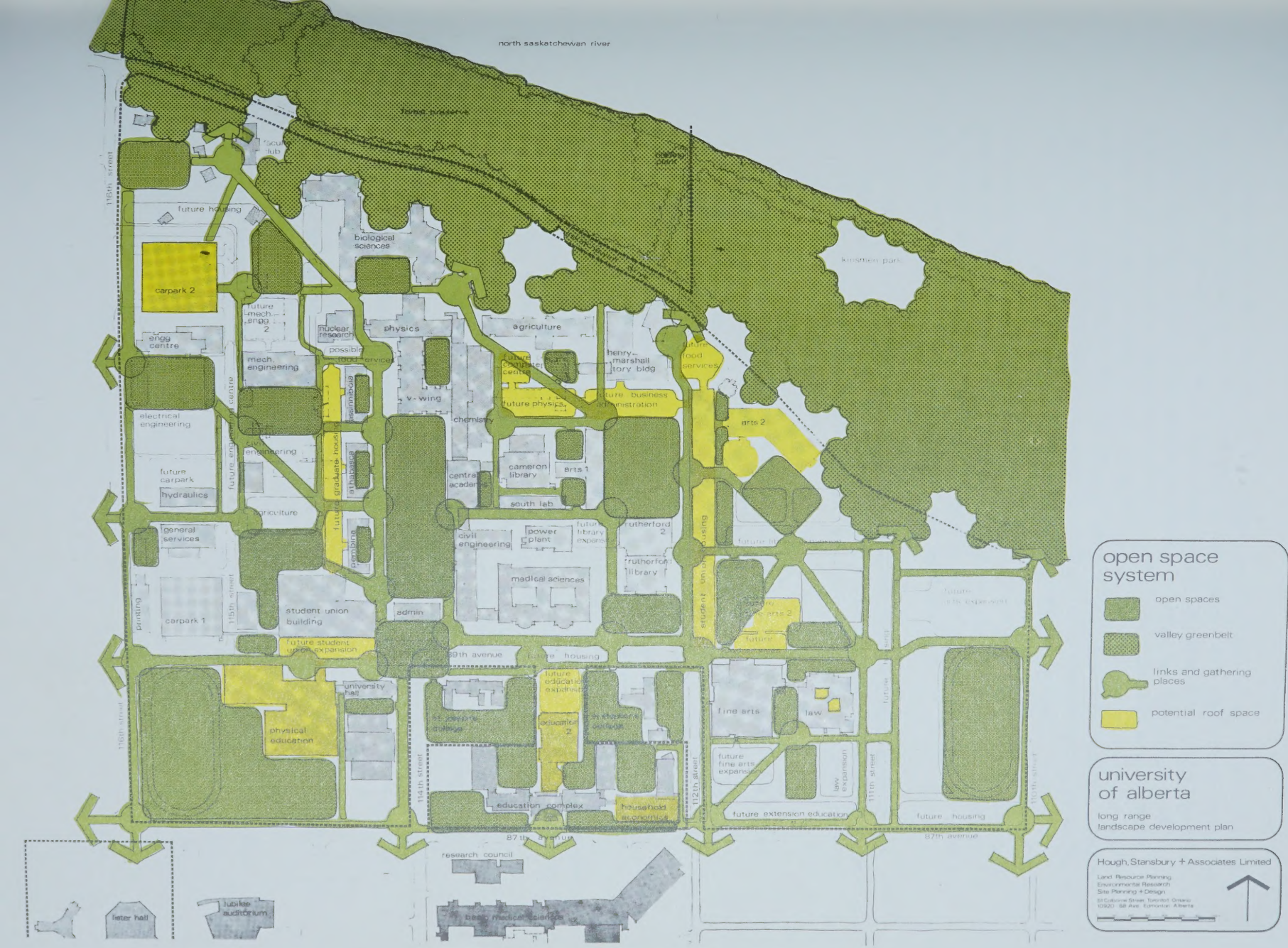


6. Where possible a combination of shallow ramps and steps is required to accommodate cyclists and paraplegics as well as emergency vehicles. Where only steps are possible they should be heated to facilitate snow removal.

7. Important pedestrian linkages that are unlikely to be accommodated by an interior system for some time should be developed to meet the demands of pedestrian movement, and protected from winter weather. e.g. Route from Lister Hall, up 116th Street. (diagram 37)

8. Major pedestrian routes in the North Garneau area and West Campus should make connections to the central campus independent of interior streets. Grade separation on the West Campus could be incorporated into future plans by taking advantage of the existing change of level. (Diagram 9)

open space system



open space system

- open spaces
- valley greenbelt
- links and gathering places
- potential roof space

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OPEN SPACE SYSTEM

The University of Alberta can no longer be considered in the traditional way: as a campus where buildings are set apart from each other by large expanses of lawn and trees. The Long Range Development Plan has now set the pattern of a tightly woven system of connected buildings and spaces, arranged to perform useful functions and satisfy the diverse needs of the people who live and work there. At the same time much of the open space existing in the developed campus is primarily residual space left over after buildings have been located. The opportunity for creating a useful and effective outdoor environment is thus often lost.

The purpose of the Landscape Plan, is to provide a framework for open spaces that will allow future planning and implementation to occur on the basis of rational guidelines and design principles. These principles, at a general level, may be summarized as follows:

1. In areas of the campus not yet developed (West Campus and North Garneau), the planning of buildings and open spaces should be integrated to ensure that open spaces can perform a positive role within the total development program.

2. They should be interconnected, with large and small spaces linked to allow continous pedestrian movement through them. Since enclosure of open space is vital in winter, sequence between them should be strongly defined.

3. They should respond to the many outdoor functions and activities of the University at all times of year. Some spaces accommodate recreational and passive activities with identifyable movement patterns through them. The quality of these spaces will be in general determined by soft landscape elements that include walks, expanses of grass, trees and shrubs. Other spaces accommodate crowds, gatherings and a high level of activity in relatively small area. The quality of these spaces will be more urban than parklike, and will include greater expanses of paving, walls, colour and signage.

   There should therefore be a maximum diversity of character between various parts of the campus, and adaptability to the day to day functions that it must accommodate.

4. They should make connections to the open space resources of the city, as links to the community at large.

5. They should provide a living environment, useful to the University community for teaching, learning, relaxation and delight.

At a more specific level the program developed in the analysis report forms the basis for development proposals and principles.

places and activity

north saskatchewan river
forest preserve
g
cooling plant
saskatchewan drive
kinsmen park
116th street
future housing
biological sciences
carpark 2
future mech. engng 2
nuclear research
physics
agriculture
engy centre
possible food service
future computer centre
henry marshall tory bldg
future food services
mech engineering
f
electrical engineering
auto drop off
civil engineering
future engineering centre
greenhouse
v wing
chemistry
future physics
future business administration
future graduate housing
future carpark
hydraulics
agriculture
general services
auto drop off
b
cameron library
arts 1
a
arts 2
south teb
rutherford 2
power plant
future library expansion
rutherford library
civil engineering
c
medical sciences
admin
plumbing building
carpark 1
115th street
student union building
future student union expansion
89th avenue
future housing
d
e
university hall
existing playfield
physical education
phys. ed. instruction field
st. joseph's college
education 2
st. stephen's college
fine arts
future fine arts expansion
future fine arts 2
future food services
future arts expansion
future playfield
114th street
112th street
111th street
110th street
household economics
future extension education
future housing
87th avenue
future transit
research council
auto drop off
lister hall
jubilee auditorium
places
a arts court
rallies, exhibits, bar b.q, dances, skating, sculpture, concerts
b central quad
water body, biological study, skating, band concerts
c central quad
dances, exhibits, bar b.qs, rallies
d arrival
information and orientation, auto drop off, displays
e fine arts
outdoor theatre, art gallery and café, gathering area
f engineering
exhibits, rallies, concerts
g forest preserve
ecological study zone
activity
1 casual sports
gathering points
outdoor teaching
outdoor dining
outdoor sitting
university of alberta
long range landscape development plan
Hough, Stansbury + Associates Limited
Land Resource Planning
Environmental Research
Site Planning + Design
61 Colborne Street, Toronto, Ontario.
10920 - 68 Ave. Edmonton, Alberta

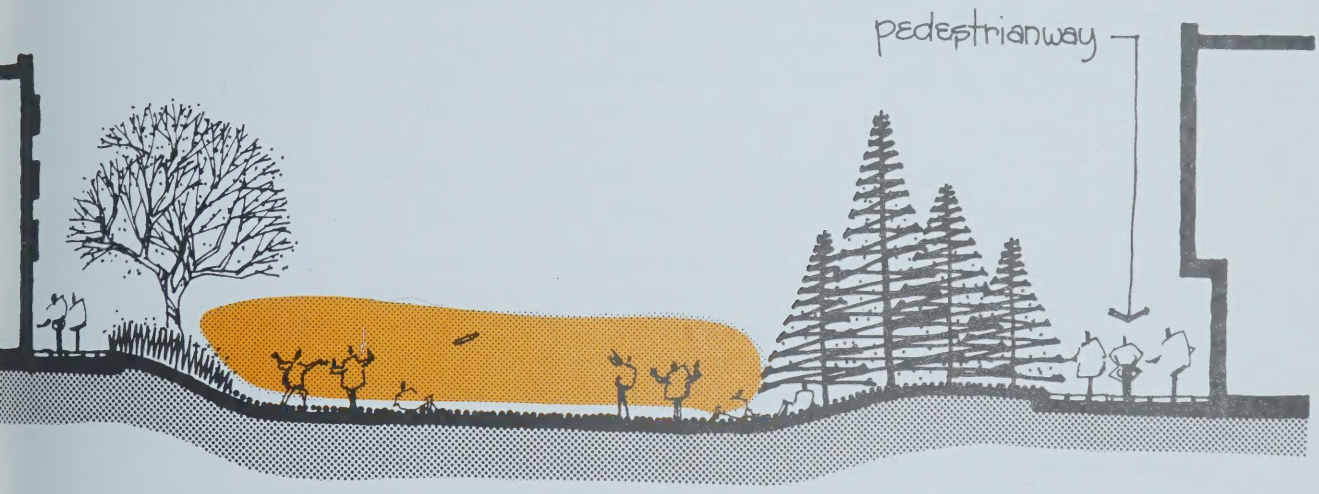
Recreation Space

1. Existing track and field facilities should be maintained for formal athletic activities. Should the recreation program require it, the track itself could be flooded in winter for skating.

2. Additional track and field facilities should be provided in the North Garneau area as proposed in the Long Range Development Plan.

3. Nine small turfed areas are proposed for casual sports, approximately 40 x 70 yards, associated with residences and high use areas. Pedestrian circulation should be directed to by-pass these areas, rather than cut across them. (Diagram 15).

15



4. Court games should be provided on roof tops, rather than at grade wherever this is feasible. New buildings without heavy servicing and roof outlets are best suited to these activities, assuming that clear space for tennis (60' x 120' per court) can be provided. The use of roof tops for court games should be a basic consideration in new buildings. No detailed information is presently available for existing buildings, but the roof space over Physical Education, and parking building #2 would be well suited to this purpose, assuming that roof loading, fencing, and access problems could be overcome.

5. Miscellaneous outdoor games such as deck tennis, shuffleboard, and badminton should be accommodated in minor spaces, outdoor sitting areas, activity centres, and in corners where they may be needed.

6. Two informal outdoor ice surfaces for winter recreation are proposed.

a) In the Central Quad.
b) By flooding a paved area in the Arts Court.

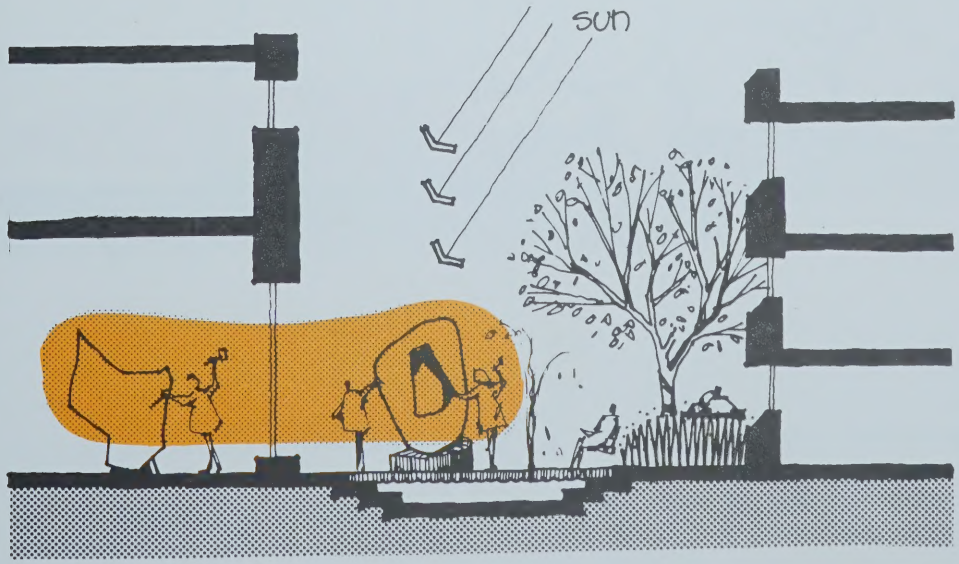
These ice surfaces should have a minimum area of 25' x 120' to accommodate free skating, broomball and related winter acitivities. Heating interior space is proposed with direct access to these areas for skate changing.

Academic Space

Specific outdoor facilities have been requested by faculties and departments in the University to satisfy academic needs. From a review of the program outlined in the Analysis Report in relation to campus requirements as a whole, it is proposed that the following facilities should be incorporated into the open space plan:

1. A pond, serving various teaching functions such as map contouring, located in an appropriate space on campus. (see Recreation Space)

2. An outdoor workshop that can serve other functions including concerts, outdoor teaching, and a meeting place, located between Arts and Law. An outdoor theatre for Drama will not become a requirement until Phase 2 of the Fine Arts Building, when Drama vacates Corbett Hall. The theatre, combined with an outdoor gallery and exhibition space should be a separate facility but related to the workshop area. It is also important as a community resource and therefore requires connections to the transit stop and parking areas. (Diagram 16, 17)



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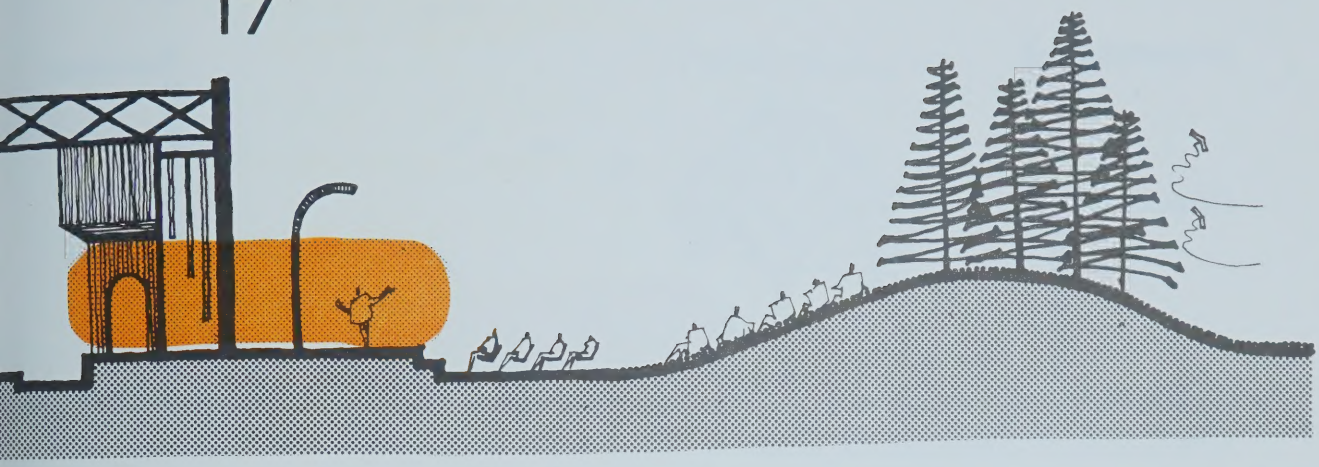
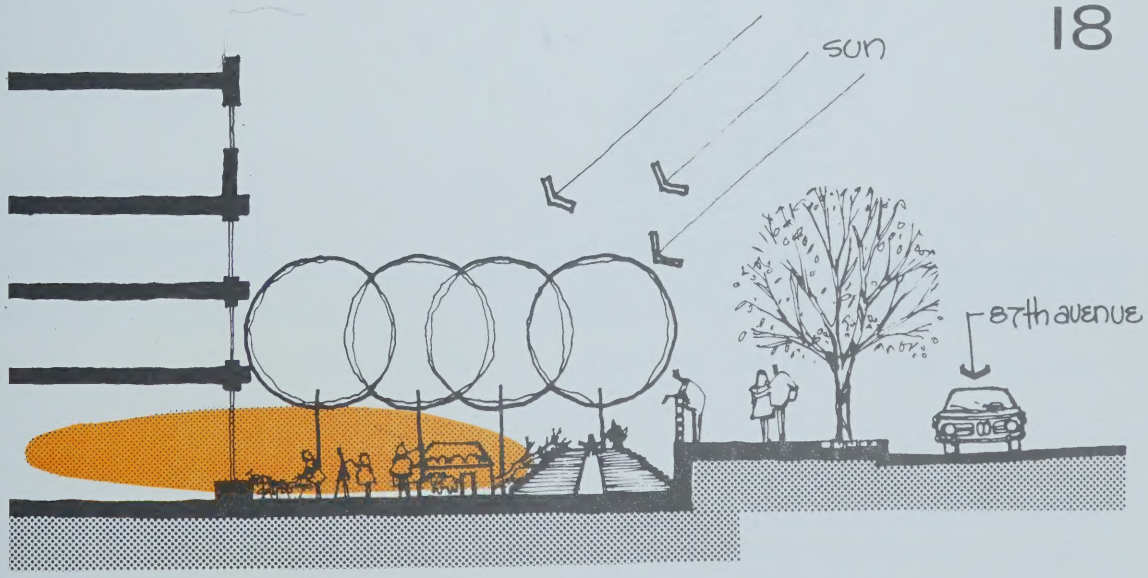


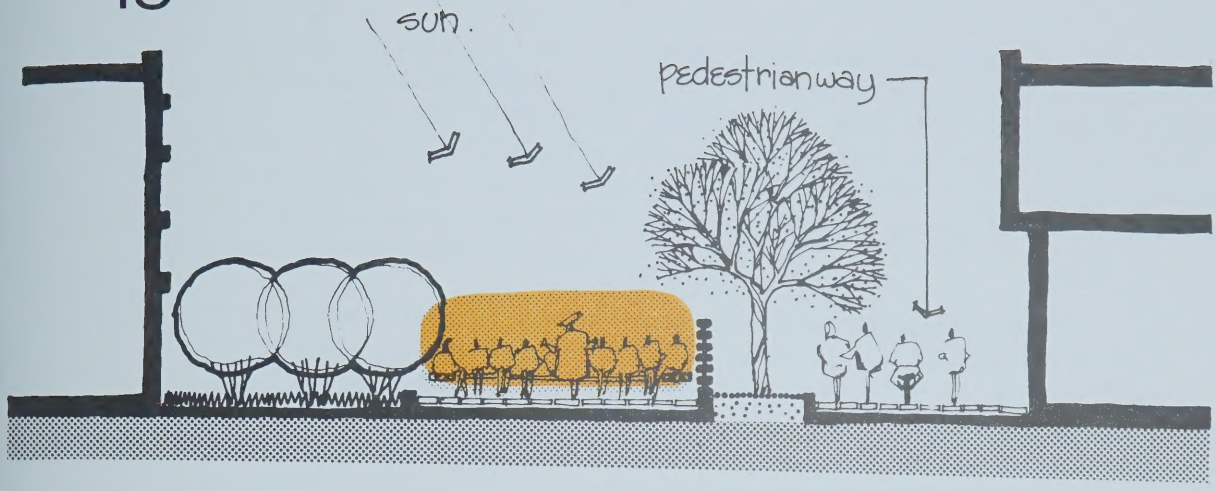
3. Kindergarten play space located on the 87th Avenue setback from Education, and allowing direct access from the indoor teaching areas of the building. (Diagram 18)

18



4. Informal outdoor classrooms for summer teaching related to a number of faculties and departments, e.g. Household Economics & Faculty of Education. (Diagram 19, 20)

19



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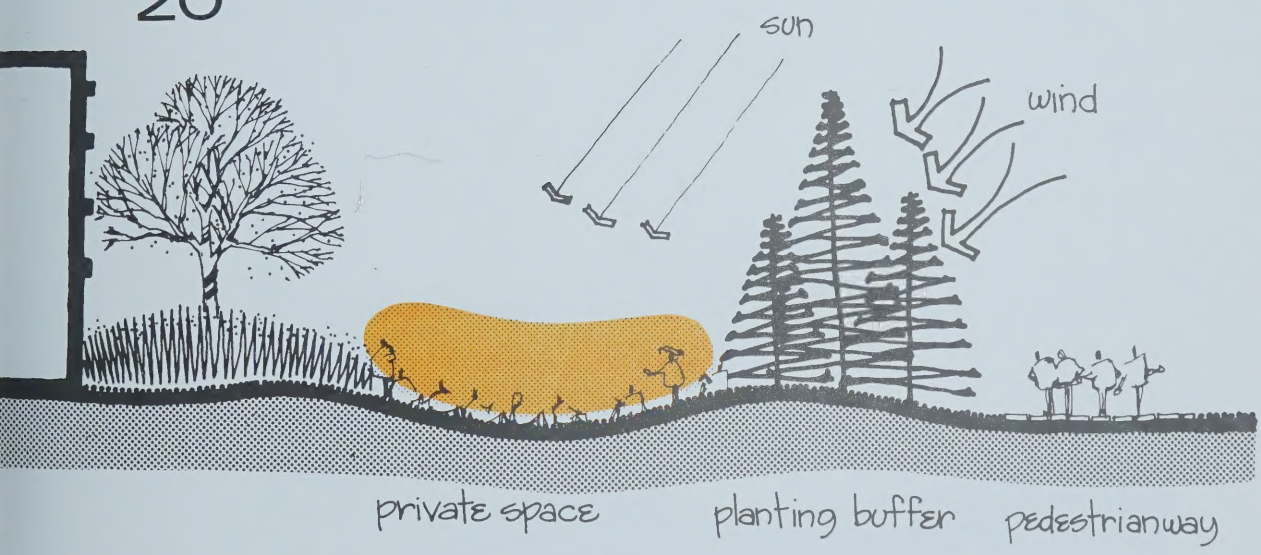


5. Informal spaces for sculpture and exhibits of various kinds throughout the campus, and specifically located in major gathering places.

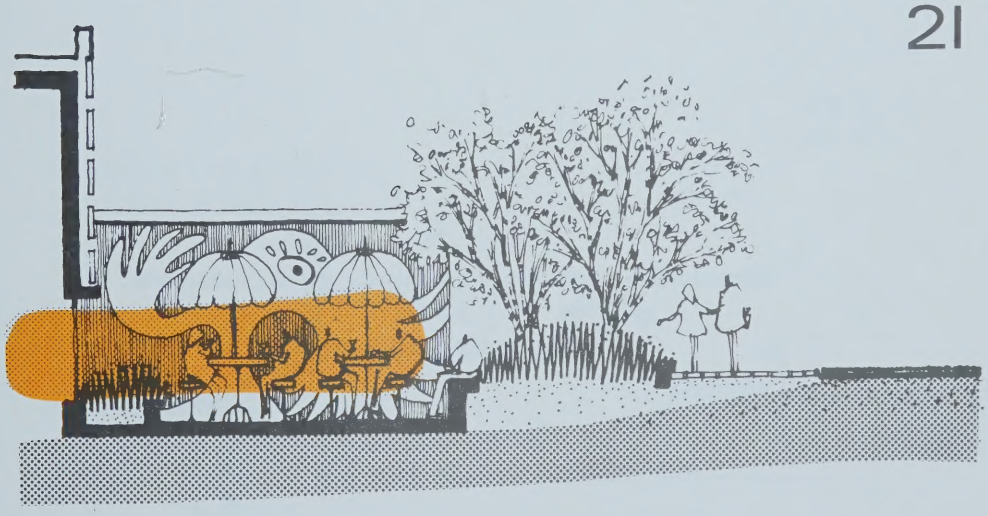
6. Fine Arts are interested in experimentation with colour, graphics, lighting, murals, etc., in various places in the campus. While no particular space specifically structured for this purpose is required, gas, water and electrical services should be provided in particular areas such as gathering places, small courtyards, etc.

Informal Space

1. Although the central quad accommodates many student activities for a limited period during the year, it should be structured to stimulate diverse informal functions at all times of year. For instance the use of water would create additional diverse activities of a passive nature and contribute to the vitality of the space. A platform for band concerts during the warm weather could be modified to serve as the heated skate changing facility mentioned above.

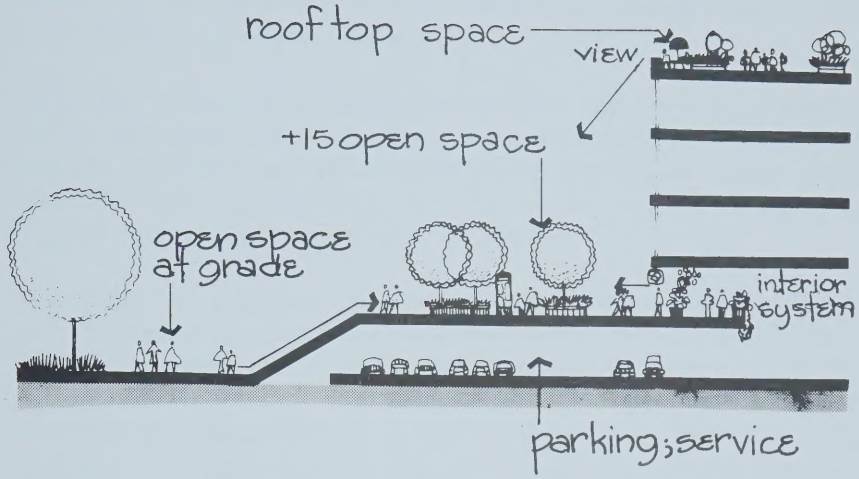
2. Dining and informal eating areas should be associated with lunch and vending machine rooms. Within the known building program some indoor facilities are located either on the second floor, or have no access to the outdoors, e.g. S.U.B. cafeteria. In future development, direct outdoor access from lunch rooms would be highly desireable. In cases where lunch rooms have to be located at a different level, the outdoor area as visual space is important . Informal barbeque and picnic areas should occur in a number of places throughout the campus, and specifically associated with Central Quad, Arts Court, and Rutherford Library Court. (Diagram 21)

21

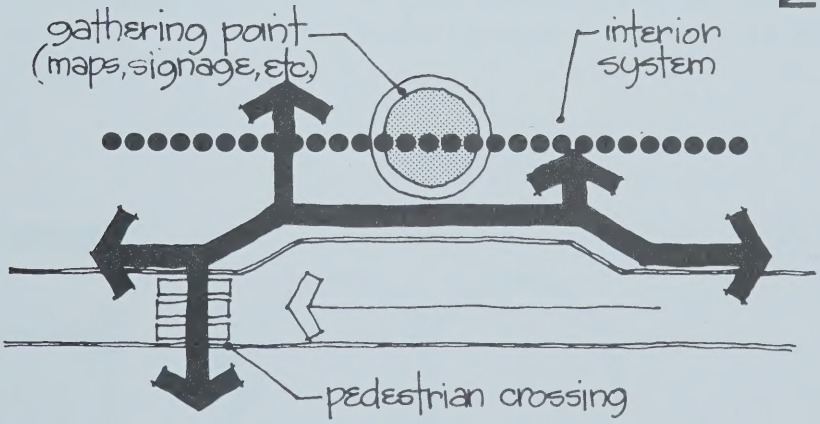


3. Campus arrival areas on 89th Avenue and 90th Avenue are major spaces where bus and car drop-off points occur. From here the student, faculty, or visitor becomes a pedestrian linking to all parts of the campus via the outdoor or indoor pedestrian street system. It is here that he is initially oriented to the campus, and will expect to find information and directions, meet other people, wait for a bus and find shelter from the wind. These are therefore significant places since they set the tone for future experience on the campus (see Pedestrian Circulation). (Diagram 22)

21a


rooftop space
view
+15 open space
open space at grade
interior system
parking; service

22

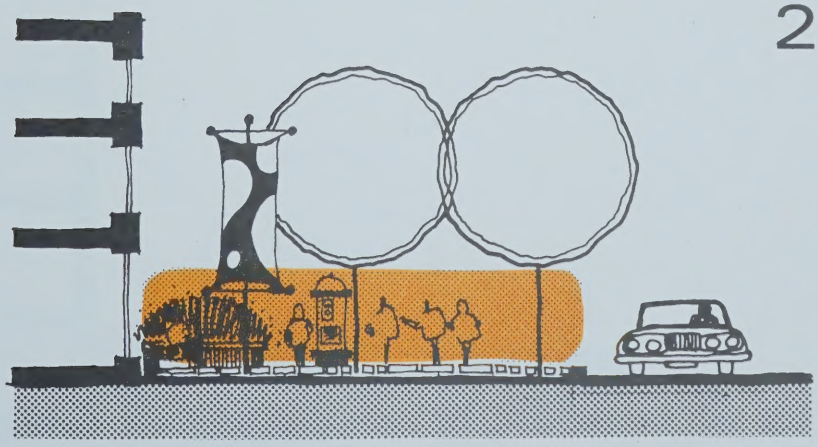

gathering point (maps, signage, etc.)
interior system
pedestrian crossing

4. A variety of small quiet areas in sunny places off major circulation routes are included, geared to the individual or small group wanting seclusion, and a place to site away from noise and activity, or for quiet study. (Diagram 20, 21)

5. Open space should be provided on roof tops and at a + 15 level particularly in situations (such as the North Garneau area) where high density development precludes significant open space at grade. There should be strong physical and visual connection between open spaces at grade and at upper levels. (Diagram 21A)

6. A number of residual spaces left over from poorly planned buildings are not readily adaptable to active use, due to problems of shadow, lack of access, etc., e.g. the courtyard north of biological sciences, It is proposed that these should be replanted with trees and shrubs and left as casual space to be discovered by those seeking quiet and solitude (see Item 3 above). Their functional use would in addition be enhanced over time as teaching space for students and faculty interested in plant materials.

7. Setbacks and street corners associated with buildings should be developed as minor meeting places, parkettes and display areas where University functions and the public could mutually benefit from interaction, e.g. Faculty of Education, Household Sciences, 87th Avenue and 112th Street intersection and future transit stops. (Diagram 23).



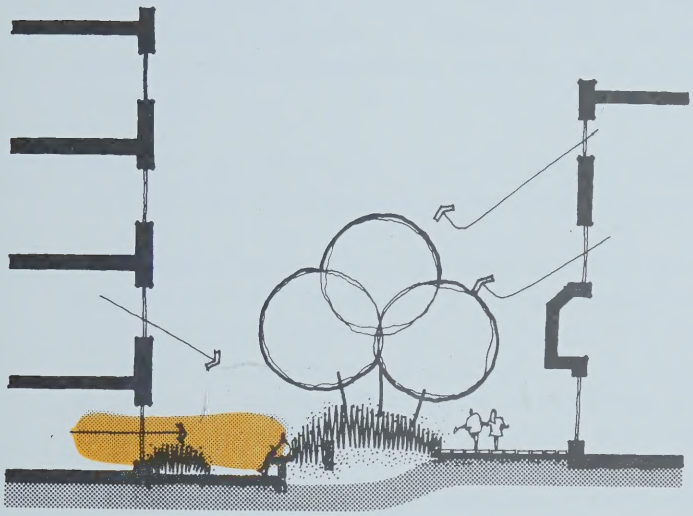
23

Visual Space

In a number of situations open spaces are related to visual rather than functionsl criteria. During the winter months particularly, the landscape is seen from inside, and has to be considered as a series of visual pictures. The various conditions which occur are summarized as follows:

1. Semi-private space associated with residences should be separated from other more noisy activities, and maintained as quiet areas for the residents. (Diagram 24, 25)

24



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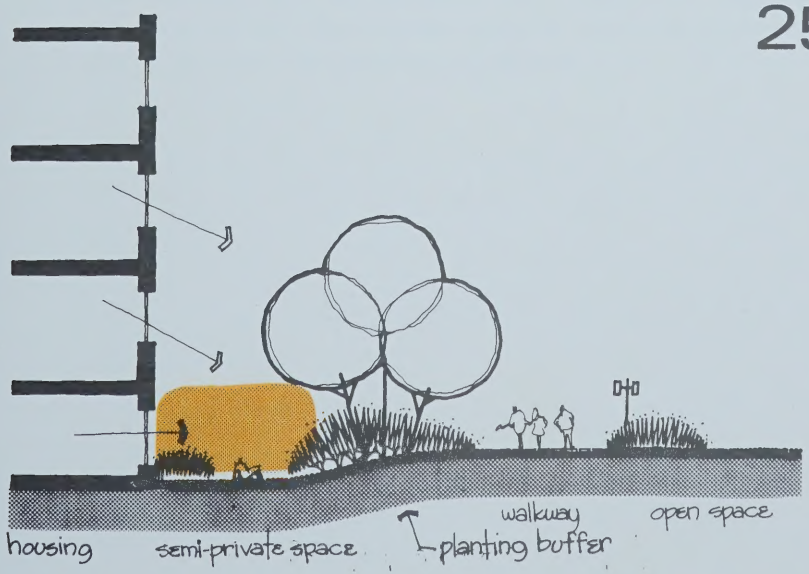


2. Views out of buildings into spaces should be considered as winter landscapes, changing with the nature of the space, and providing identity with the outdoors as the pedestrian moves through the interior street.

3. Views into buildings from outside also have potential in revealing the activity and colour of indoor spaces. In addition, the new Engineering Building will be equipped with machinery that could provide added interest when seen from the outside. It is suggested that clear glass be used in new buildings where this is practical, and that the question of sun screening be resolved in other ways. (see section on Planting)

4. In small courts or constricted spaces, the use of colour, super-graphics, sculpture or elements that catch sunlight, or snow can create visual life and excitement when there are no activities outside.

5. The use of lighting at night to create visual images has a potential that will be discussed further in a later report.

6. The use of water is important during summer and winter for visual and functional reasons. Fountains and water displays, however, should be considered as sculptural elements in winter, and allowed to freeze to create a great variety of forms, colour and reflective surfaces. Water that is not considered as a year round event has little value in the harsh climate of Alberta (see section on Climate)

7. Roof tops seen from tall buildings that cannot be used for any functional purpose, should be considered as visual space, and treated as abstract art surfaces. Roof space for new buildings that are unsuitable for hard court games could become valuable roof gardens for a variety of passive activities.

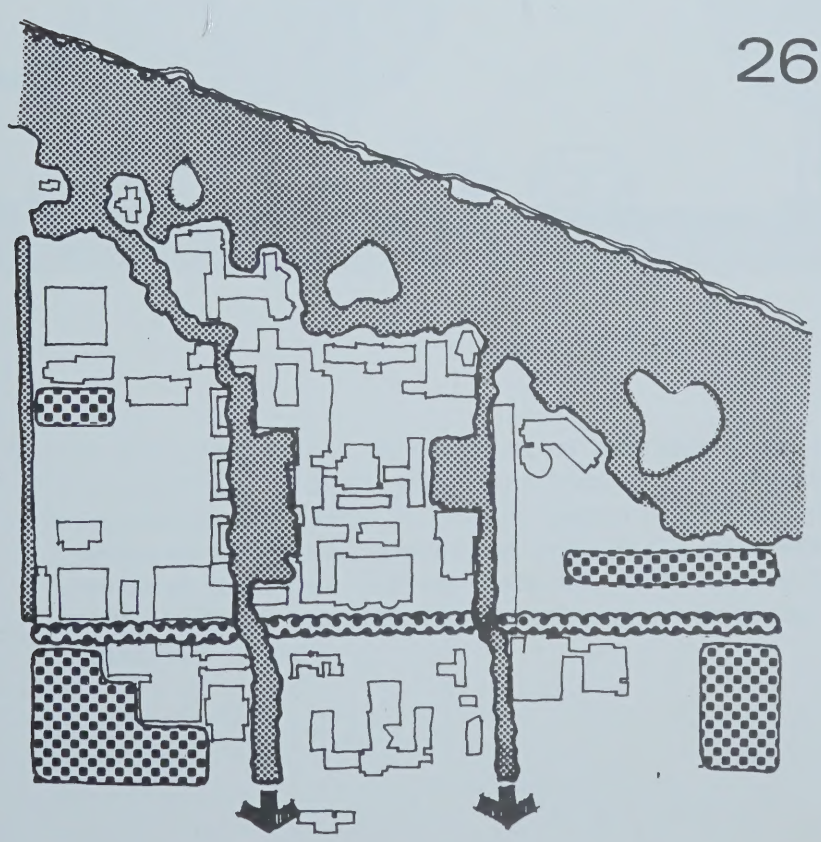
planting

PLANTING

Plants provide the primary landscape elements on the campus, and contribute largely to the visual quality and function of open spaces and pedestrian ways. Of prime importance is the impact of winter and summer on the way plants should be used. The planting concept is seen, as having three levels of involvement; (i) The major elements, deciduous and coniferous trees, provide an overall structure and identity to the parts of the campus at all times of year. They identify and reinforce major circulation routes, shelter belts and wind free areas, open and closed spaces, and provide visual unity throughout the campus, (ii) The smaller trees and shrubs, at the scale of the pedestrian, provide diversity through their colour, texture, and variety at all seasons, (iii) The low ground covers,turf and flowers,have impact during the spring and summer months when the snow is off the ground. The great diversity of plants that will grow in the Edmonton climate, and which are evident in parts of the University can best be exploited within the context of an overall planting concept proposed in the landscape plan.

The principles which the planting concept are based are outlined as follows:

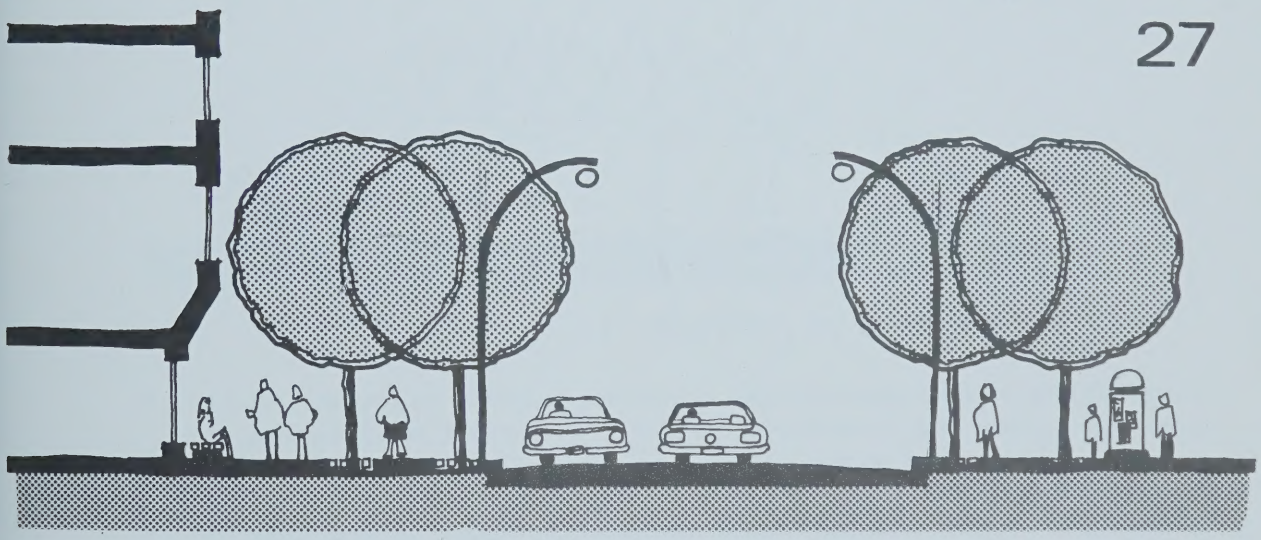
1. The introduction of green corridors into the campus is a primary principle and should occur (i) at major entrances, (ii) along major pedestrian routes linking the river valley to the campus, (iii) at points along the periphery (see diagram 26)



2. Major pedestrian routes that form continous links through the campus assume an identity of their own through the massing of trees along them. The north-south route through central quad is proposed as a wooded greenway of massed coniferous trees providing a park-like character and focus. It is extended to create a link with the recreational corridor of the river valley. The 112th Street route is more closely associated with buildings and urban functions and is proposed as a major avenue of deciduous trees, more formal in character. It also makes connections with the river valley.

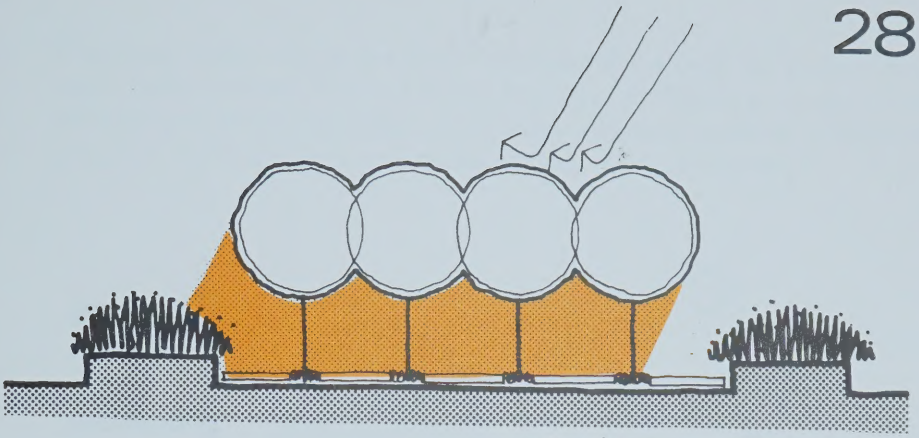
3. Other pedestrian routes may be a reflection of the different planting environments along the way.

4. Planting along streets should be considered as avenue tree planting that reflects the requirements of appropriate scale, shade and continuity to street facades. (Diagram 27)



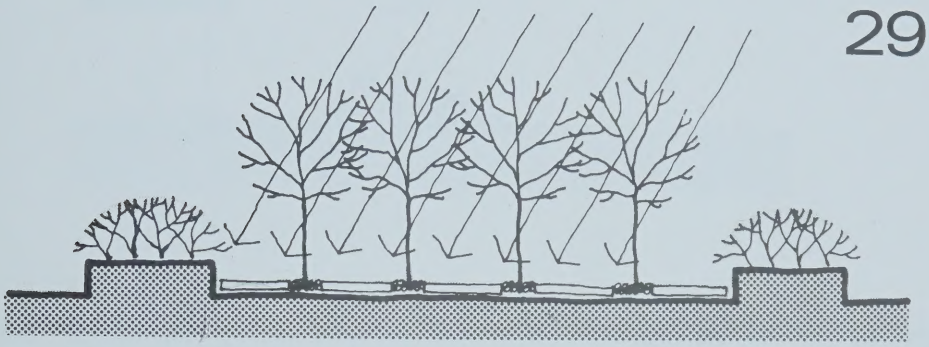
5. In gathering places where much of the floor is paved, deciduous canopy trees provide shade and coolness in summer and allow sun penetration in winter. Trees massed in groves rather than considered as individual specimens provide the greatest impact and heighten the value of plant material. The generally slow growth rate of plants in the Edmonton climate emphasizes the principle. (Diagram 28, 29)

28



planting in summer

29

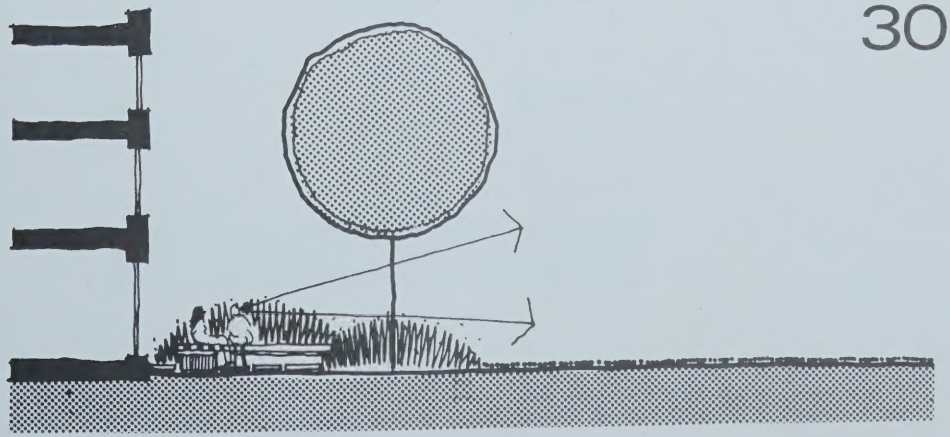


planting in winter

6. Lower forms of planting should be incorporated into raised planters to protect them from snow removal equipment, and heavy pedestrian movement. Planter edges also provide casual seating.

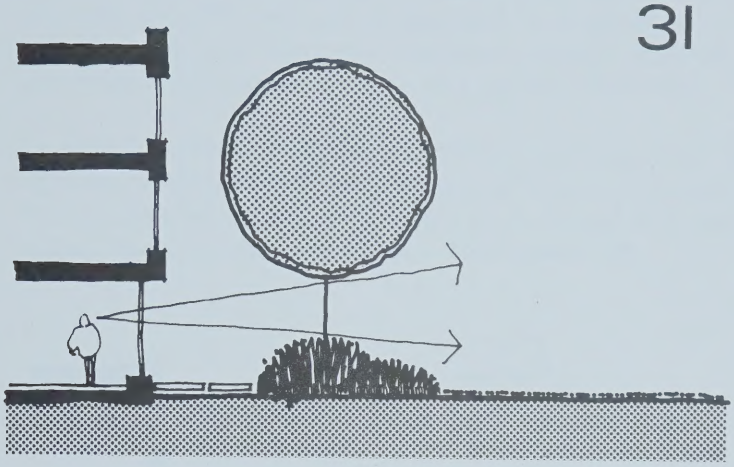
7. In open spaces where athletics or other functions occur, and where there is pedestrian activity on the periphery, planting provides spatial and functional definition, and frames views. (Diagram 30)

30



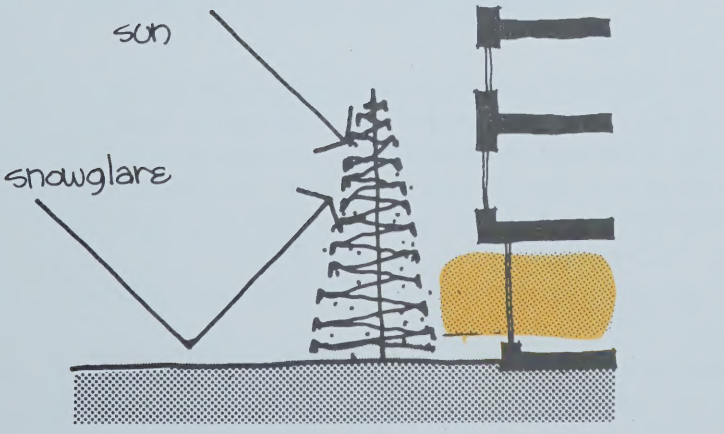
8. Planting adjacent to interior pedestrian street is important to outdoor space when viewed from inside. It frames views, creates foreground and provides continued interest during winter when interior streets are in constant use. (Diagram 31)

31



9. Snow glare and intense light into interior spaces can be effectively reduced by the use of plants, and is visually preferable to tinted glass. (Diagram 32)

32

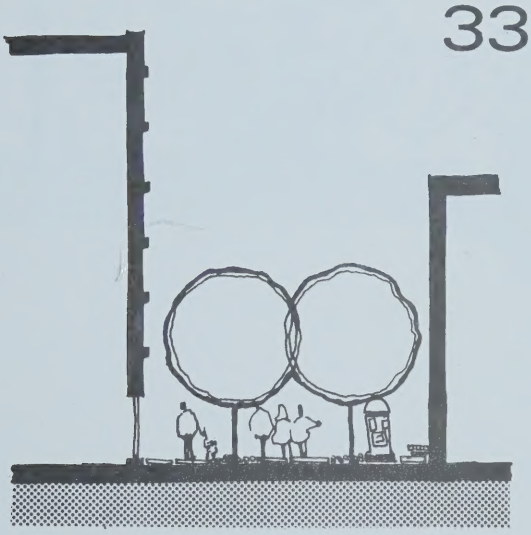


10. Plants associated with outdoor spaces that form an extension of indoor cafeterias or lounges are important to maintain visual interest during winter months, and to create a protected environment during spring and summer. (Diagram 2l)

11. Minor passive spaces and sitting areas may be planted informally to create quiet secluded areas. It is here that the richness and variety of different plant species is appropriate and where plants may be enjoyed for their flowers, scent, colour and form during summer months when they are primarily used.

12. In small left-over spaces between buildings or narrow corridor spaces where architectural scale is overpowering, plants should be massed to create a canopy as a visual foil to buildings, and allow free movement below. (Diagram 33)

33

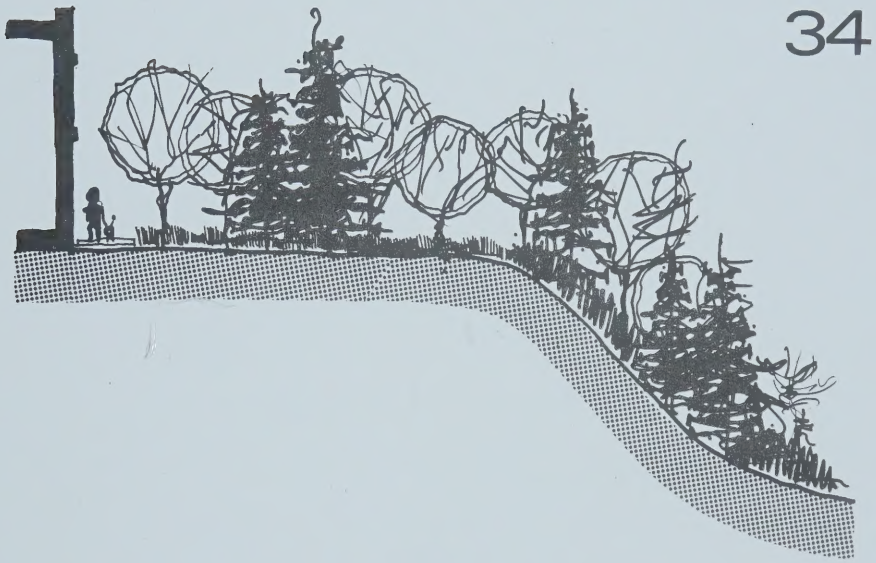


13. In small courtyards where the character of space is appropriately defined by building or where shade or space restrictions preclude the use of plants, architectural elements such as supergraphics and colour on walls and floors add to the diversity of the campus through contrast between planted and architecturally defined spaces.

14. Planting may be used as visual screening for service area.

15. The planting of the river bank should be extended across Saskatchewan Drive and up to the north end of the campus. Planting in some areas should have the quality of the natural forest, in others it may be more formal. The intent should

be to allow open and closed areas to act as a foil to buildings in places, and provide views across the valley in others. Forested landscape within the campus has educational value by providing a study area for regenerated plants and animals on plateau land; it has functional value by reducing potential erosion of the crest of the bank and reducing the problem of wind generated in the open area between buildings and the existing tree line; and it has aesthetic value by creating useful and pleasant extensions of the river greenbelt into built up areas. (Diagram 34)



climate

climate

numbers relate to diagrams on following pages

university of alberta

long range landscape development plan

Hough, Stansbury + Associates Limited
Land Resource Planning
Environmental Research
Site Planning + Design
61 Colborne Street Toronto, Ontario
10920 - 86 Ave. Edmonton, Alberta

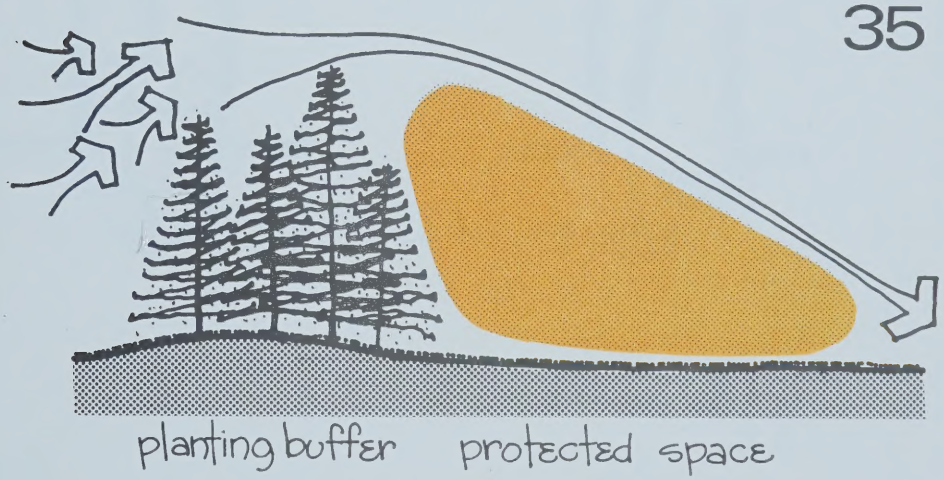
CLIMATE

The analysis report summarizes the most important considerations of climate that centre on micro-environments, wind protection, and exposure to the sun. The effective design of outdoor space to counteract undesirable conditions and encourage desirable ones is a primary consideration of the master landscape plan. Thus the objectives and principles that relate to climate are outlined as follows:

a) Enclosure of space is a fundamental requirement, and should be achieved by building form or by major trees, or both. Two contrasting examples of protected environments may be cited; firstly, the Art Gallery lawn enclosed by plant materials, secondly the future Arts Court, to be enclosed by buildings.

b) Large open spaces to remain on the campus, including the existing track and field area, and the proposed facility in North Garneau require shelter belts of coniferous trees to provide protection against prevailing winds. (Diagram 35)

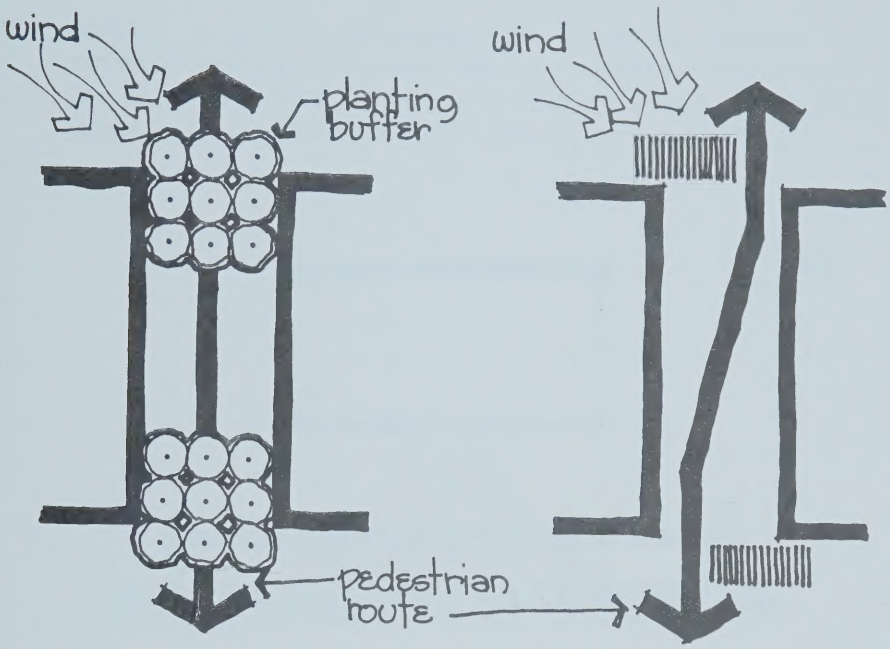
35



c) Venturi winds through building openings, or in restricted connecting spaces should be protected by dense planting while allowing access through them. Alternatively walls or screens arranged to deflect wind may modify the wind where planting is inappropriate. (Diagram 36)

d) Walks associated with large open areas that are exposed to winds should be protected by high shrubbery, trees, walls or screens. e.g. The walk from Liester Hall along 116th street. (Diagram 37)

e) Sitting areas, useful in early spring or late fall, or on calm days in winter should be oriented to the sun and baffled against driving snow. Study of localized wind patterns is essential in each individual case to prevent snow build-up and the consequent unuseability of such places at these times. (Diagram 37)



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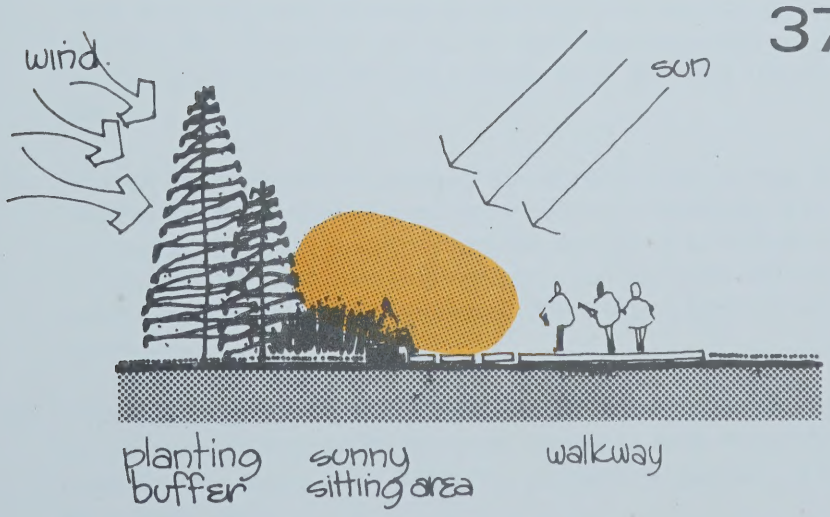
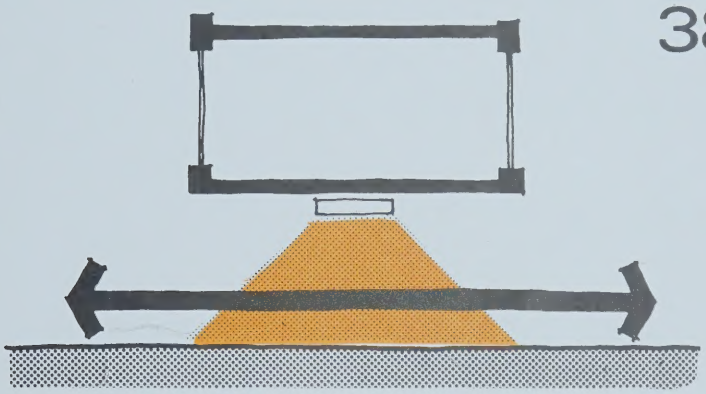


37

f) The siting and massing of future building should allow sun penetration into courts that are enclosed by them.

g) Interior public use areas in new buildings including dining areas, cafeterias, lounges, etc., should be oriented south where they can be exposed to the sun, and where they give onto outdoor use areas.

h) Gathering places, or pedestrian connections under buildings require radiant heating elements that will provide momentary warmth along an outdoor route. They will also be useful on cold but calm days when it is pleasant to be outdoors. (Diagram 38)



38

i) Bus drop-off and pick-up areas require heated shelters for people waiting for buses or cars. In new development these should be incorporated into buildings and connect into the interior pedestrian street.

j) Views from interior pedestrian streets into winter spaces require elements to create visual interest and diversity with sculpture, changes of level, water sources designed to freeze as ice sculpture, bright colour and supergraphics. Landscape spaces may be planted with trees and shrubs selected for their winter fruit, texture and form.

k) The development of tropical plants in interior pedestrian streets is an important factor to provide contrast and relief from the exterior winter environment. This should be the subject of further research at a later date.

implementation

IMPLEMENTATION

The University's development program will continue to be active for some years to come, during which time disruptions to the day-to-day life of the campus will be inevitable. Pedestrian movement, open space, traffic circulation, servicing, will be modified and changed, and the task of ensuring that disruptions are minimized will require ongoing planning. Each development phase must be arranged to allow permanent site development where it is possible, and temporary development that satisfies functional and social needs where it is not. The objectives that relate to temporary site development, include hoardings, temporary parking lots, preservation and relocation of trees, are documented in the Interim Report #1, March 1971 prepared by the Landscape Consultants. This report is included in Appendix 1. Some further comments may be summarized here:

1. Temporary walks should be located to respond as far as possible to pedestrian desire lines, and have a width consistent with the traffic it has to accommodate (see section on Pedestrian Movement).

2. Hoardings protecting construction sites should be designed to last the duration of the project without major deterioration. The base colour should be white rather than the forest green presently specified. Hoardings provide an ideal opportunity for colour, advertising, and art work, and could provide a basis for the involvement of interested University groups in their design.

As each phase of the building program is scheduled it is recommended that guidelines pertaining to site planning criteria should be prepared by the Campus Development Office and Planning/Landscape Consultants, as a part of the terms of reference given to consultants. These should then form the basis for a project consultant's work and will provide him with basic information on the requirements and constraints of the site in relation to the Long Range Plan. These include the following:

1. <u>Proposed Buildings</u>

   a) Proposed site area in relationship to campus plan.
   b) Vehicular circulation - access and egress.
   c) Service routes, required servicing points, and methods of servicing parking requirements.
   d) Emergency fire routes to be maintained.

e) Pedestrian movement patterns to be maintained - general location of major entrances and exits.
f) Location of site features to be preserved or exploited, and requirements for their protection.
g) Location and description of major site uses that pertain to, and will have an influence on the building.
h) Requirements for uses of roof space.
i) Requirements governing the orientation of public use areas in the building - relationship of dining, lounges to outdoor areas, views to be exploited, etc.
j) Climatic factors - requirements of sun penetration to outdoor and indoor spaces, protection of entrances, etc.
k) Location of temporary walks, requirements for hoardings, tree protection and/or removal, site access.
l) Outdoor services to be provided from building, i.e. water, hydro.

2. Proposed Site Development

a) Proposed site area in relation to campus plan.
b) Program requirements, and site uses to be provided.
c) Methods of implementation, timing, construction scheduling
d) Factors related to building concept and program.
e) Vehicular parking and servicing criteria.
f) Emergency routes.
g) Pedestrian movement criteria.
h) Site features to be preserved, or protected.
i) Principles relating to all aspects of site development - movement, links, gathering places, use areas, visual criteria, planting, climatic factors, materials, etc. (Based on Long Range Landscape Planning Criteria).
j) Outdoor servicing criteria - water, hydro, gas, irrigation, etc.
k) Existing servicing on the site.
l) Topographical data, site inventories.
m) Maintenance criteria.
n) Budget - policy regarding guarantees

A major objective of the landscape plan is to provide useful and pleasant places that meet the demands of the University Community within the context of an overall framework. Community involvement then is crucial to its success as the various stages are realized.

The Analysis Report survey of University needs, and subsequent discussions with staff and students has indicated that the outdoor environment on campus is important to them from aesthetic, social, and academic points of view. Many people have indicated an interest

in the outdoors for teaching. Biology, Plant Sciences, Arts, Drama, Education, Household Science, Athletics, will either have use for individual spaces, specifically designed for a particular teaching function, or for a number of places that can be used informally throughout the campus. Students use the outdoors for meetings and rallies. In addition, the Works of Art Committee has interest in providing sculpture and works of art in the outdoor campus.

To achieve this objective it is proposed that study be given to ways in which active participation could occur, without unnecessarily burdening the University with added administration.

The following considerations are suggested in this regard:

1. The setting up of temporary user committees of interested teaching departments and student bodies to provide detailed program requirements to the Campus Development Office and its consultants, when particular projects are being considered. For instance - the development of landscape plans for the Faculties of Education and Household Economics, would specifically involve these particular faculties. The redevelopment of Central Quad which is more related to the campus as a whole, might include a wider representation of user groups drawn from academic, administrative and student bodies.

2. The use or development of certain campus spaces by interested Faculties, Departments or students. This would involve the setting up of administrative machinery to coordinate and budget for various programs that such bodies might be considering. This capability already exists in part; for instance, the use and development of the river bank for ecological study by Biological Sciences. The idea could be taken further. For instance, the Department of Fine Arts might wish to experiment with murals, colour, art, and lighting in various parts of the campus, others might wish to set up temporary art or sculpture exhibits, and others might want to take on the improvement of construction hoardings.

Since interest in active participation in the evolution of the outdoor campus appears to be fairly strong among a number of groups, the opportunity for creative input at various levels should not be overlooked and could contribute considerably to the quality and usefulness of the campus for those who live and work there.

phasing

phasing

university of alberta

long range landscape development plan

Hough, Stansbury + Associates Limited
Land Resource Planning
Environmental Research
Site Planning + Design
51 Colborne Street, Toronto 1, Ontario
10920 - 88 Ave., Edmonton, Alberta

PHASING

The University development program will continue to evolve over a number of years. As buildings are erected, and the street system modified in accordance with long range objectives, open spaces on the campus will become available for redevelopment. The following projection is suggested to facilitate the phasing of possible landscape program over the next few years. It is based on the University's present building program, and the kinds of landscape development, in terms of temporary or permanent work, that could reasonably be planned for at any given time. Phasing should also be up-dated as other development areas are scheduled.

Area 1 Central Quad. The building program for this area is now complete and permanent development could now take place. The space between Assinniboia residence and V-wing could be a part of this development, on the assumption that future food services would not be located in this space. It is a recommendation of this report that this space be left open to accommodate a major pedestrian route and gathering place. This walk could also be incorporated into development plans.

Area 2. The northerly extension of the walk and its environs beyond Nuclear Research could be developed after July 1972 (see area 4). Future housing is unscheduled as is the south extension of Biological Sciences. However, if this latter development were to occur only one link in the route would be affected.

Area 3. Replanting and development, north side of Biological Sciences, could be implemented at this time.

Area 4. Revised site planning to the service area south of Biological Sciences could be undertaken when the existing service road is replaced by the one proposed in the landscape plan (see service traffic). This is contingent on completion of Mechanical Engineering (July 1972).

Area 5. The Arts Court permanent development is contingent on completion of Student Union (Aug. 1972), Chemistry (October 1972), Rutherford Library Phase 2 (January 1973), and Business Administration (February 1974). Thus construction in the area will be continuous from this year until February 1974. Development of the Court will not be possible until after this time unless access for construction traffic for Business Administration can be brought in from the north side, rather than through the court. Under these

latter circumstances development would be possible in the Spring of 1973, making allowances for construction work on the north side. The north-south walk on the east side would require temporary routing until buildings were completed. The service road east side of the old Arts Building should be eliminated when the court is built.

Area 6. Rutherford Court could be implemented following completion of Student Union Housing (August 1972).

Area 7. The pedestrian route west side of Rutherford Library could be included as a permanent walk in conjunction with Rutherford Court. The future west extension of the library would require a temporary re-routing of the walk to the east.

Area 8. The northerly extension of the route west side of Student Union Housing to the river valley may be scheduled following completion of housing and food services (May 1973). Upgrading of the space around Tory Building may also be scheduled at this time.

Area 9. Spaces immediately adjacent to Arts 2 may be permanently developed following completion of the building (July 1972). Site areas around Rutherford House should remain undisturbed until a decision on its future has been made.

Area 10. Fine Arts 1 and Law Court may be permanently developed following completion of Fine Arts (September 1972).

Area 11. Site development in the vicinity of Future Food Services will not be required until a program is scheduled for this building. No activity in this area is anticipated until then.

Area 12. The walk south from Student Union Housing will be required when Household Economics and Fine Arts are completed (September 1972). The new loop and turn on to 112 St. for the 89 Street bus will also be scheduled then. This area should be included as a total permanent development at that time.

Area 13. Household Economics and Education 1 extensions are scheduled for completion (June 1972, and January 1973). However, the Household Economics court cannot be completed until the Education Library extension is built.

Area 14. Negotiation with St. Josephs College with a view to integrating land uses could be undertaken at the same time as the open space development around the Education Complex (January 1973).

Area 15. Present pedestrian traffic through the parking lot on St. Stephen's College property will be redirected on to the east side of 112th St. once Household Economics is completed. The need for negotiation between the College and the University will therefore become a less urgent matter.

Area 16. Permanent landscape development on the periphery of the playing fields and in visitors parking lots may be scheduled at the present time. The 116th walk from Lister Hall should be developed at the same time as the widening of 116th Street.

Area 17. The major walk from visitors parking on 114th St. may be scheduled as a permanent route once 89th St. West has been closed (Aug. 1972).

Area 18. The Student Union extension is unscheduled. The space between the present building line and Physical Education should be developed on a temporary basis once the street has been closed (Aug. 1972). Since it is a major circulation area it should be designed to accommodate pedestrial movement with temporary walks between buildings and sodded. Some planting may be included on the basis that plants will have to be moved at a future time.

Area 19. The arrival and bus loop on 89th Avenue may be scheduled for permanent development in 1972 when it becomes one-way. Allowance for future housing on 89th Avenue should be made.

Area 20. Since 89th St. Housing is unscheduled, the Street will remain an exterior pedestrian route until such time as a building program is established. The bus stop, and south side of the street should therefore be developed on a temporary basis in the near future.

Area 21. Service to the south side of Convocation Hall should be eliminated in favour of access to the north side. The service roads, north side of Rutherford Library should also be eliminated in the near future. The small spaces in this area could be redeveloped on a temporary basis and used informally as minor routes and possible sitting areas for a number of years.

The present pedestrian connection between South Lab and North Power Plant, and its associated spaces cannot be permanently developed until the future westerly library extension and internal pedestrian street is scheduled. Temporary development is therefore proposed for this area to accommodate pedestrian movement.

The Central Academic Building cafe court is presently under construction. The service to engineering and Medical Sciences will remain, and could be upgraded.

Area 22. The greenhouses will be demolished when the extension to Agriculture is completed (July 1973). This space will remain in temporary use for some years, until the Computer Tower and Physics are scheduled. Temporary development should include a path system across it, and an informal playing field for adjacent housing, until additional proposed facilities can be provided in North Garneau, and associated passive areas. Court games, such as tennis courts should also be provided here until adequate roof space is available in other areas, such as Parking Structure 2, and Business Administration.

Area 23. The service and parking for the Tory Tower presently located on its south side should be moved to the north side to accommodate servicing changes when Business Administration is built (February 1974). This space will require redesign at that time.

appendix

INTERIM REPORT 1

LONG RANGE LANDSCAPE DEVELOPMENT PLAN

MARCH 1971

TREE PROTECTION

A. Scope and Purpose
B. Analysis and Philosophy
C. North Garneau Demolition and Parking
D. Trees to be Preserved
E. Trees to be Relocated
F. Appendix 1

CONSTRUCTION LANDSCAPE

TREE PROTECTION

A. SCOPE AND PURPOSE

A discussion of the philosophies and practices of tree preservation and relocation; and the causes and effects of tree damage as a guide to the Campus Development Office at the University of Alberta for establishing policies which will ensure that the plant resource is used to maximum benefit.

B. ANALYSIS AND PHILOSOPHY

The University of Alberta campus possesses a great resource of plant material, consisting of a variety of native and cultivated species of ground covers, shrubs, and trees. Many specimens are particularly valuable since they are of hardy stock and may not be duplicated.

In the North Garneau section of the campus an inventory and analysis of plant material was carried out by Butler-Krebes Associates Limited. For the greater campus area, however, there appears to be no inventory of the existing plant material.

As the Long Range Development Plan becomes a reality, many areas of the campus will be required for development. During implementation stages much of the plant material resource may be destroyed, due to either immediate or long term effects, if precautionary measures are not taken to ensure that it is preserved.

The present attitude toward plant material is that it is secondary to development, rather than being one of the parameters, along with functional space requirements, location, services, etc., which have an influence on the shape which development takes.

The Tree Study for North Garneau outlines specimens to be relocated, to be preserved and to be destroyed, the general assumption being that if at all possible, the trees must be relocated. The report states that "in several instances, good quality specimens have been recommended for demolition because of accessibility problems. These physical obstructions include dwelling foundations, retaining walls and difficult ground contours". In addition "a few good specimens have been recommended for demolition because of their close proximity to other specimens." A blanket operation of moving all trees except those which are diseased, too large, of little horticultural value, or inaccessible to moving equipment,may not be the most economical solution. Consideration must be given to the value of plants, or groups of plants in their original locations and the possibility of integrating them with new development.

At the present time, the inventory of a site scheduled for development almost disregards existing plant material. The planning and design stages are carried out without regard for the influence of existing plant material on the development. Along with the inventory of a site, which includes existing services, topography, etc., there should be included an inventory and analysis of plants, stating species, size, health, stability, the inherent value of the trees in their original locations, their capability to be moved, etc. This information should become one of the parameters within which the siting of the building, its physical shape and related outdoor spaces are determined.

The decisions to preserve trees in their original locations, relocate or destroy them must be based on the following priorities:

1. The age and health of the plant, which will determine its life expectancy and value in the development of any area.

2. The horticultural and environmental value of a plant or group of plants in an existing location. As a single specimen, a plant may have little value. In association with other plants, however, it may be quite important.

3. The location in relationship to excavations. If a tree is close to the edge of an excavation, it may possibly be saved if precautionary measures are taken.

4. The possibility of damage during construction operations. In some cases damage may be unavoidable.

5. The cost of relocating a plant compared to the cost of a new plant. This applies particularly to shrubs and small trees.

6. The effect which moving may have on the health and form of a plant.

7. The time available to prepare a tree for moving operations.

8. The elevation of new areas adjacent to the root-zone of the tree. In some cases the cost of precautionary measures required may be so expensive that it would be more sensible to move it.

9. The effects of a changed micro-climate on the health of a tree. The location of the plant in relationship to the future building and resultant sun and wind exposure must be studied.

10. The use of plants in other locations on campus. In order to make the best use of plant material, its relocation from building sites should be coordinated with the implementation of the Long Range Landscape Development Plan.

When the preliminary design of a building and its adjacent spaces has been determined, with the preceding facts in mind, the final decision may be made regarding the future of the plant material. At this point action may be taken to prepare the trees either for preservation during construction or for relocation to another site.

The major areas of concern where existing plants may be affected, and measures must be taken to ensure that they are protected are:

1. the construction of new buildings, services and utilities throughout the campus.

2. the demolition of houses in North Garneau and the subsequent use of the vacant land for temporary parking until it is required for development.

In these areas of the campus, trees are being damaged in the following ways with either immediate or long term effects on the tree:

i) roots are being removed from trees in excavation areas; e.g. Excavation for utility tunnels along 112th Street.

ii) materials, equipment, construction shacks, etc., are being stored over root-zones of trees, causing compaction of soil in root-zone, and the prevention of air and water movement.

iii) indiscriminate operation of equipment, around plants causing damage to roots, trunk and branches. (see appendix 1)

C. NORTH GARNEAU DEMOLITION AND PARKING

In the North Garneau area, the practices of demolition of the remaining houses must be studied in relationship to the protection of the existing plant material. In the past, there appears to have been no control on demolition procedures with the result that many trees were damaged or destroyed.

Before demolition begins decisions should be made with regard to priorities of plants to be demolished, and those to be protected. If these decisions are made, then it will be possible to remove some of the plant material, thereby, increasing accessibility to houses and leaving good specimens free of possible damage during demolition.

In order to ensure the protection of these plants, there must be strict control on demolition procedures by means of contract specifications and supervision.

The intent of this control should be:

1. to limit access points to each house rather than allowing machinery to enter throughout the site.

2. to prevent damage to roots, trunks, or branches of specimens by machinery, storage of materials and debris.

3. to ensure repair to damaged specimens.

In the area of North Garneau where the houses have already been demolished, the vacant land is being used for temporary parking. The lack of control has allowed traffic and parking over the root-zone of plants, compacting the soil, damaging the roots and trunk, and contaminating soil with chemicals.

As this area becomes required for expansion of buildings, temporary parking will be allocated to areas further east where houses will be demolished. In view of the fact that temporary parking will continue and it is important to preserve as many trees as possible, it would be advantageous to reorganize the parking lots with an inexpensive system of portable barriers.

Such a reorganization would not only help protect trees; but also increase the efficiency of the lots by parking the same number of vehicles in less space with fewer access and egress points. These measures should be undertaken in conjunction with temporary signage.

D. TREES TO BE PRESERVED

1. Preparation

Prior to construction, root pruning, pruning and spraying should be carried out in order to put the tree in a healthy condition and change its physical condition to suit its new environment. Root pruning, for example, will decrease the area of the root-zone, thereby allowing excavation or movement of machinery closer to the plant without notable damage. (see diagram 2)
If ends of branches are a hinderance to building construction, they should be removed and the cuts repaired by standard horticultural practices to insure the health of the plant. Regard should be given for the ultimate shape of the plant during pruning operations.

2. Hoardings

Prior to the commencement of construction, hoardings must be erected around the tree for the purpose of protecting the root-zone and trunk from mechanical injury during construction processes. Depending on the location of the plant in relation to construction it may be protected either by snow fence or plywood hoardings. Where intense construction occurs with the movement of heavy equipment and trucks, it is recommended that the plywood hoardings be used. Periodic and frequent inspection of the hoardings is necessary in order to ensure that they are being maintained during the construction period. In the case of tall trunks which may be damaged by machinery, planking should be fastened around the trunk to the height of the first branch. Nailing into the trunk should not be permitted. (see diagram 1)

3. Damage to Plants

Should accidental damage, in the form of broken or scarred branches, scarred trunks and torn roots, occur to plants, these injuries should be repaired immediately by standard horticultural practices.

4. Changes in Level

The existing elevation of the root-zone if at all possible, should be maintained. If it becomes necessary, however, to change the grade around a tree, the roots must be preserved and their need to get air and moisture must be accommodated. (see diagram 3,4,5)

5. Storage of Materials

A common cause of injury to root systems is the storage of construction materials such as gravel, concrete forms, steel, etc., and the erection of construction shacks over the root-zone. Action

must be taken either by means or hoardings and/or supervisory control, to prevent these parctices.

6. Site Access

Consideration must be given to the location of site access routes in relation to plant material. Temporary roads should not be constructed over the root-zones of trees and their limits should be defined through the use of snow-fence or hoarding. Movement of machinery and construction elements should be supervised to avoid injury to trunks and branches of trees.

7. Construction Boundary

Construction operations should be confined to a specific area in which they can be efficiently accommodated. This area should be enclosed by hoardings and the necessary procedures taken within it to protect plants. The area adjacent to the construction site must be kept free of equipment, machinery, materials, debris, parked vehicles, etc., in order to protect plant material.

8. Pedestrian Movement

Consideration must be given to pedestrian movement and new circulation patterns which are established as the result of construction sites. Wooden walkways should be located in order to accommodate this movement, at the same time protecting root-zones from compaction and allowing air and moisture to penetrate. The location of temporary routes adjacent to trees must be planned to minimize the possibility of injury to trunks by snow moving equipment. (see diagram

9. Supervision

During the construction period, there must be regular and frequent supervision by the University's qualified representative to ensure that:

i) plants are not being abused, i.e. being used as anchors for chains or ropes; being damaged by swinging cranes, etc.
ii) hoardings are being respected and maintained; and
iii) damaged plants are being properly repaired. Upon completion of construction operations, hoardings should be removed and the plants inspected for injury.

10. Maintenance

Excavations adjacent to trees result in changes in drainage patterns and water levels which will affect the growth of the tree. It may be necessary to provide a temporary water supply (along with artificial feeding) for the plant during this time. Dust which collects from construction operations and prevents air and water movement should be washed periodically from the leaves of trees adjacent to construction areas.

11. Specifications

Specifications, relating to construction operations, should be included in the contract of every building project to ensure that the contractor is aware of his responsibilities for the protection of trees and existing conditions and structures. It should be clarified that he will be liable for any damage which occurs to them as the result of negligent operation of equipment. A penalty clause which covers the possibility of irrepairable damage could be included. Any such clause should be related to the value of specific plants in the overall development scheme. In some cases a damaged tree may have been invaluable to the proposed scheme and, therefore, it may be necessary to redesign that particular area.

E. TREES TO BE RELOCATED

The satisfactory relocation of trees is not based on the simple fact that the specimen produces leaves the following year; but that:

i) its natural appearance and form have been maintained;
ii) it is in a vigorous growing condition without dead branches;
iii) it is free of insects and diseases;
iv) it continues to flourish for many years.

In order to produce such results, strict horticultural practices must be observed before, during and following moving operations.

1. Method of Transplanting

There is a great variety of standard methods for transplanting large trees, along with the possibility of devising new approaches for specific situations. In order to determine the most satisfactory method, each situation must be evaluated with regard for the following factors:

i) the development schedule of a specific site in order to determine the time available to prepare the plant for moving.
ii) the time of year when the plant is to be moved.
iii) the size of plant and its root ball.
iv) the type of plant; i.e. species, form, deciduous, coniferous, etc.
v) the present and future locations of the specimen in relation to other plants, walls, buildings, etc., thereby determining accessibility. In some cases a manual operation may be necessary, rather than use of large machinery.
vi) the horticultural and aesthetic value of the plant. If a plant is particularly valuable, a more involved process may be used in order to ensure that it survives.
vii) the type of soil in both present and future locations;
viii) the distance to the new site;
ix) the cost of the operation.

It is the recommendation of the Consultants that a specific area be evaluated in order to demonstrate the principles which have been discussed.

2. Micro-Climate

Consideration should be given to the sun and wind exposure in the new location. A change from the type of micro-climate in which the plant matured can cause changes in the biological processes which may be either beneficial or detrimental to its health. It is advantageous, therefore, to relocate a plant to a situation which has similar micro-climate. In the same context, plants should not be placed where they will be affected by airconditioning exhausts and service vents.

3. Preparation

Following the decision to move a plant, action must be taken to prepare it for the operation.

i) Root Pruning creates a compact root zone and invigorates the plant to produce a new system of feeder roots, while at the same time reducing vigour and demand of top growth. This procedure must commence early enough to allow the plant to become stabilized with a new system of roots. The time which is required to form new roots depends on the species of plant.

ii) Pruning reduces the crown to correspond to the reduced root system. Damaged, diseased and weak parts of plants shall be removed. It is imperative that the natural form of the specimen be maintained.

iii) Spraying must be carried out prior to transplanting to ensure that the plant is free of insects and disease.

4. Planting and Guying

The new location for the plant should be properly prepared before moving. It is important that it be large enough to accommodate the root-ball as well as topsoil surrounding it. In order to stabilize the plant in its new location and allow new roots to be formed, the tree should be securely guyed. These supports should be maintained until the plant becomes established. (see diagram 7)

5. Maintenance

In order to insure that the plant continues to flourish, a maintenance program should be established to follow the initial moving operation. This should consist of pruning to prevent growth of suckers, spraying, feeding, and irrigation, and be continued until such time as the plant regains its stability. The length of time will depend on the variety of plant material since some species rejuvenate more quickly than others.

F. APPENDIX

1. Causes & Effects of Injuries:

a) Movement of vehicles over root-zones of plants:

i) compacts the soil which prevents penetration of air and water to feeder roots and causes roots to become pot bound.
ii) causes physical damage to roots, e.g. bruising, strangulation, etc.
iii) causes chemical damage from salt, oil and gas which may drip from vehicles.

b) Negligent operation of construction equipment cause damage to trunks and branches which

i) increases susceptibility to insects and disease;
ii) allows loss of moisture and subsequent drying of inner tissues;
iii) reduces sap flow and causes bleeding thus robbing food supply.

c) Removal of large anchor roots for excavations reduces nutrient supply to the tree and causes instability.

d) Placement of fill or impervious paving over root zones causes suffocation of roots due to lack of air and water.

2. Treatment of Injuries:

a) All cuts in pruning should be made cleanly, with no splitting or tearing of adjacent bark and wood, and at proper depth and angle for promotion of scar.

b) Cuts over 1" in diameter should be treated with an approved tree paint to prevent drying loss of sap and entrance of disease and insects.

c) A well-drained fertile soil should be backfilled around cut roots to provide a loose growing medium which will allow the severed roots to regenerate.

d) Abrasions to trunks and branches should be treated by tracing and trimming, and tree-paint applied before dirt, insects, or disease infestation is allowed to accumulate in such wounds.

CONSTRUCTION LANDSCAPE

One of the most common complaints of students, faculty and staff is the disruption of the campus by construction projects; buildings, utility tunnels, sewers, etc. These areas are the cause of much of the visual deterioration of the campus environment due to: fallen down snow fence hoardings, construction materials, equipment and vehicles scattered beyond the hoardings, ugly green hoardings, etc. Subsequently pedestrian movement becomes disrupted and conflicts with construction operations are common.

The fact that the University of Alberta campus will be the site of construction for many years suggests that it would be advantageous to give consideration to temporary ways of improving the environment of construction zones. The construction period of many projects lasts from 1½ to 2 years. Rather than being detrimental, they could become beneficial in providing vitality and life to the normal functions of the campus.

Construction hoardings offer the possibilities of:

i) adding variety and interest to the environment through the use of colour
ii) explaining to the community, through the use of graphics and words, the project under construction
iii) providing places for campus advertising by means of posters, banners, supergraphics, etc.
iv) allowing students to express themselves graphically
v) providing "free canvas" to students in the Fine Arts Department.

The possibility of creating a modular system of construction elements should be studied. This system could consist of hoardings, wooden walkways, signage, seating, etc., which would be easily adapted to each new construction project.

At the present time hoardings are supplied and erected by the contractor of each building project according to the specifications issued by the consultant, which state that new 4' x 8' plywood sheets must be used and painted 'forest green'. The layout for the hoarding is controlled by the Campus Development Office. Walkways are provided by the University Physical Plant under direction of the Campus Development Office.

A modular system of temporary elements could be implemented in either of the following ways:

i) the units may be owned and supplied by the University to be erected either by the contractor or the University
ii) the units may be owned and supplied by the contractor from detail drawings provided by the University.

The former method may be more advantageous for the following reasons:

i) a higher standard of design could be attained for less expenditure of money and supervision
ii) the units could be stored by Physical Plant and used as new projects are developed
iii) the University could have greater control of the use of hoardings for advertising purposes and for the use by students
iv) the hoarding units could be better integrated with other temporary elements.

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